



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**

NATIONAL MARINE FISHERIES SERVICE  
Northwest Region  
7600 Sand Point Way N.E., Bldg. 1  
Seattle, WA 98115

December 6, 2002

MEMORANDUM FOR: The Record

FROM: D. Robert Lohn  
Regional Administrator

SUBJECT: Endangered Species Act (ESA) Section 7 Consultation Biological  
Opinion On Modification 1 of Section 10 Incidental Take Permit  
1233 for Recreational Fisheries Conducted by Idaho Department of  
Fish and Game; Consultation Number F/NWR/2001/01465

FEDERAL AGENCIES: NOAA Fisheries

PROPOSED ACTION: Issuance of Modification 1 to Permit #1233 to IDFG for the conduct  
of recreational fisheries that target non-listed, hatchery-origin,  
anadromous salmonids and resident game fish species in the Snake  
River Basin of Idaho. Permit #1233 allows IDFG to conduct  
recreational fisheries that may incidentally take anadromous salmon  
which are listed under the Endangered Species Act. Modification 1  
to Permit #1233 extends fisheries authorization to additional waters  
which may be open for anadromous salmon fishing and provides  
authorization for incidental take of threatened Snake River Basin  
steelhead. The permit, as modified, will expire December 31, 2004.

CONSULTATION

CONDUCTED BY: Sustainable Fisheries Division, Northwest Region, NOAA Fisheries

SUMMARY: NOAA Fisheries concludes that operation of the referenced recreational fisheries is  
not likely to jeopardize the continued existence of endangered Snake River sockeye salmon,  
threatened spring/summer chinook salmon, threatened fall chinook salmon, or threatened Snake  
River Basin steelhead.

In arriving at these conclusions, NOAA Fisheries considered the best available scientific and  
commercial information, as well as comments from the Northwest Fisheries Science Center,  
NOAA Fisheries, and other Federal and non-federal technical experts and resource managers in  
the Northwest Region. The administrative record for the attached consultations is on file with  
NOAA Fisheries' Sustainable Fisheries Division, Northwest Region in Seattle, Washington.

Attachment

Consultation Number: F/NWR/2001/01465  
Modification 1 to permit #1233

# BIOLOGICAL OPINION

Issuance of Modification 1 to  
Section 10(a)(1)(B)  
Incidental Take Permit 1233  
for Recreational Fisheries Conducted by  
Idaho Department of Fish and Game

Agency: National Marine Fisheries Service

Consultation Conducted By: National Marine Fisheries Service,  
Northwest Region  
Sustainable Fisheries Division

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## **1.0 Consultation History**

This biological opinion analyzes the effects of the National Marine Fisheries Service (NOAA Fisheries) proposed issuance of a modification to permit 1233 for Idaho recreational fisheries. The proposed permit modification includes three elements: 1) expanding the areas where spring chinook salmon recreational fishing may occur, 2) applying a sliding scale method of annual approval for incidental take of Snake River spring/summer chinook salmon, and 3) considers the effects of incidental take on Snake River steelhead now that take prohibitions have been promulgated. The Idaho Department of Fish and Game (IDFG) submitted a request on January 23, 2001, to modify permit 1233, issued on May 26, 2000, under section 10 (a)(1)(B) of the Endangered Species Act (ESA). Permit 1233 covers three broad categories of Idaho recreational fisheries: 1) resident sport fisheries, managed under “General Fishing Regulations”, 2) anadromous salmon fisheries managed under “Anadromous Salmon Fishing Regulations”, and 3) summer steelhead sport fisheries managed under “Steelhead Fishing Regulations” (summarized below).

The NOAA Fisheries has issued two previous permits to Idaho for their recreational fisheries since listing wild Snake River Sockeye Salmon as endangered (November 20, 1991, 56 FR 58619), Snake River spring/summer and fall chinook as threatened (April 22, 1992, 57 FR 14653) and Snake River Basin steelhead as threatened (August 18, 1997, 62 FR 43937). In 1993, the IDFG applied for and NOAA Fisheries subsequently issued permit 844 that same year after completion of a biological opinion (NMFS 1993). Permit 844 expired December 31, 1998, and Idaho applied for a new permit (#1150) which was issued on May 28, 1999, and expired at the end of 1999.

The current permit (#1233) was issued on May 26, 2000. At the time of permit issuance, take prohibitions had not been promulgated for Snake River steelhead which were listed as threatened on August 8, 1997. The cover letter attached to the permit indicated that NOAA Fisheries would amend the permit at the appropriate time to address the change (Cain 2000). NOAA Fisheries now proposes to amend the permit to address steelhead take.

The IDFG’s application for permit 1233 was accompanied by a conservation plan that details how fisheries are conducted and is still in effect. The fisheries addressed under permit 1233 contain the same activities that were initially addressed by permits 844 and 1150 and continue to be similar in time, location and effect to the activities assessed in the earlier permits.

## **2.0 Proposed Action**

This consultation modifies and complements the original consultation and biological opinion which addressed issuance of permit 1233 (NMFS 2000a). Except where specifically addressed here, the analysis of the original opinion (NMFS 2000a) remains valid, as do the unmodified conditions of permit 1233. This opinion only addresses the effects of the proposed permit

modification and includes three elements: 1) expanding the areas where spring chinook salmon recreational fishing may occur, 2) applying a sliding scale method of assessment for the annual review of Idaho's recreational Snake River spring chinook salmon fishery, and 3) considers the effects of incidental take on Snake River steelhead now that take prohibitions have been promulgated. The permit modification will apply for the remainder of the five-year term of the existing permit. The provisions of the existing permit relative to fisheries managed under General Fishing Regulations and Steelhead Fishing Regulations will not change and remain valid for the period of the existing permit.

Impacts on listed steelhead from fisheries directed at resident fish species will be addressed separately in a Fisheries Management and Evaluation Plan (FMEP) developed by the IDFG under limit 4 of this 4(d) rule (50 CFR 223.203 (b)(4)) and currently pending determination by NOAA Fisheries. Impacts on listed steelhead resulting from fisheries directed at non-listed hatchery-produced steelhead are addressed in the proposed modification to permit 1233.

The following sections of this opinion summarize the existing permit (section 2.1), proposed management and location changes to chinook recreational fisheries (section 2.2), NOAA Fisheries' amendment of the permit to address steelhead take (section 2.3), proposed modifications to the special conditions section of permit 1233 (section 2.4), and the action area (section 2.5).

## **2.1 Recreational Fisheries**

Permit 1233 authorizes annual incidental take of listed Snake River salmon resulting from recreational fisheries management by the IDFG. The permitted fisheries are classified by the IDFG, and referenced in this opinion, as follows:

Resident Fish Species Sport Fishing - General Fishing Regulations. The general statewide stream season in Idaho runs from Saturday of the Memorial Day weekend through November 30. Exceptions to the general stream season include certain river sections that are open year-round and rivers or stream sections that are closed to all fishing for all or part of the general stream season. Most lakes, ponds and reservoirs are open to fishing the entire year, with exceptions to protect particular resources.

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### Anadromous Salmon Sport Fishing - Anadromous Salmon Fishing Regulations.

Fisheries for spring/summer chinook salmon occur in the Clearwater River basin, South Fork Salmon River, Rapid River and portions of the Little Salmon River and typically occur from mid-April through the first full weekend in August (no later than August 7). Closing salmon fishing on or before August 7 is designed to protect listed fall chinook. Chinook fisheries are selective for unlisted, hatchery-produced fish which are marked by removal of the adipose fin. Barbless hooks are required to facilitate release of fish. All unmarked fish, including listed hatchery fish and all naturally produced fish regardless of listing status, are recognizable by an intact adipose fin, and must be released unharmed if

incidentally hooked. Seasons are set based on status of listed fish, quotas of non-listed components and annual take limits of ESA-listed components of the run. Chinook fisheries may be closed on short notice when in-season monitoring indicates that harvest objectives or incidental take levels have been met.

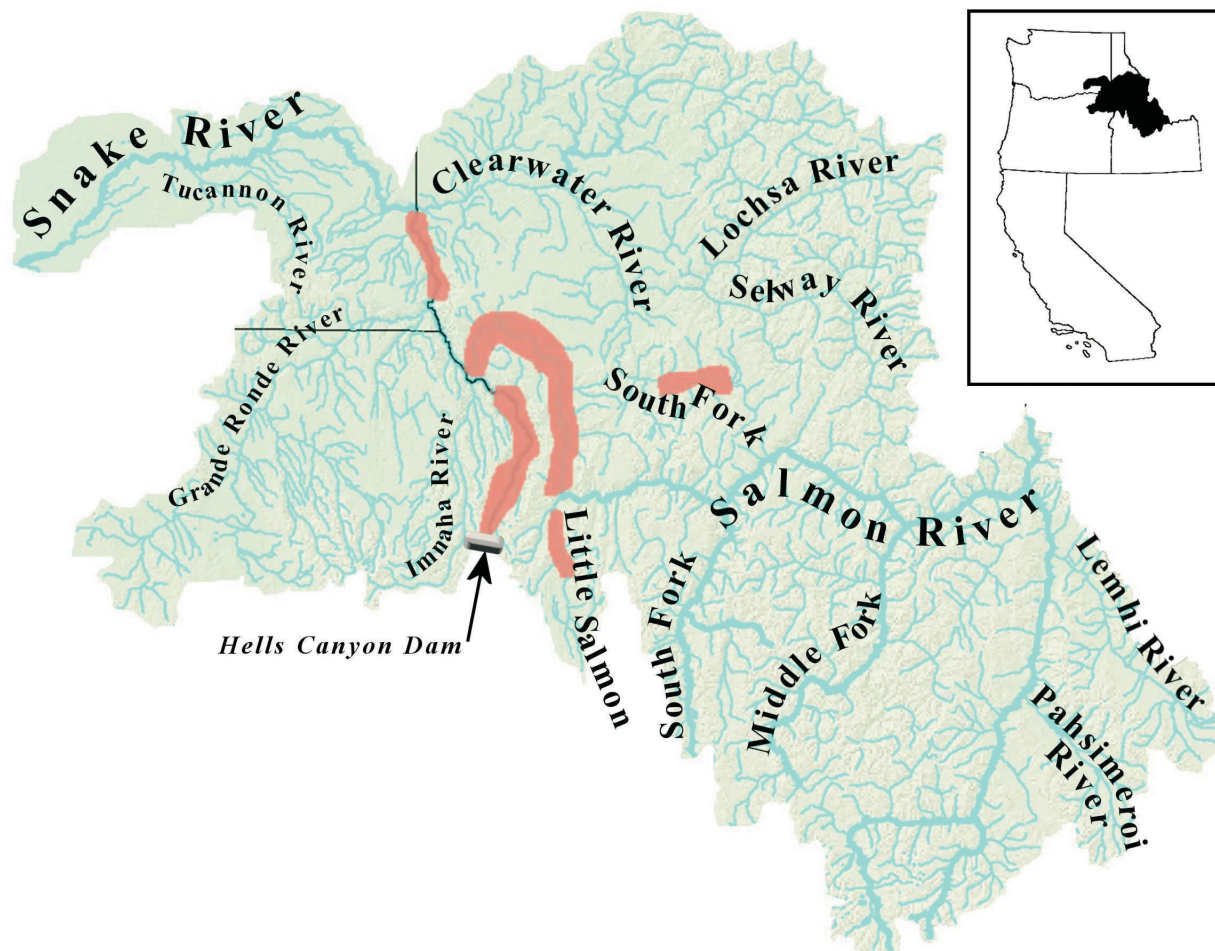
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**Spring and Fall Steelhead Sport Fishing - Steelhead Fishing Regulations.** Steelhead fishing seasons are restricted to the Clearwater River and Middle Fork Clearwater River downstream from Clear Creek, the North Fork Clearwater River downstream from Dworshak Dam, the South Fork Clearwater River, the Snake River downstream from Hells Canyon Dam, the Salmon River downstream from Redfish Lake Creek and the Little Salmon River downstream from Smokey-Boulder Bridge. The steelhead harvest season lasts from September 1 through April 30, except steelhead may not be harvested until October 15 on the Clearwater River and the mainstem Salmon River closes on March 31. Tributaries and the headwaters of the listed rivers are closed to harvest of steelhead.

General regulations for resident species recreational fishing and steelhead regulations are set biennially. Anadromous salmon fishing regulations are set annually, based on analysis of each year's run projections. Salmon regulations are often not finalized until actual counts of salmon migrating upriver confirm pre-season predictions of run size and composition. The regulations may be adjusted within one or two weeks of the season opening.

## **2.2 Modifications to Management and Spring Chinook Fishing Locations**

NOAA Fisheries is proposing to amend permit 1233 to allow annual review and reauthorization of the permit for the remaining years of the permit. NOAA Fisheries is also proposing to modify permit 1233 to include additional locations in which the IDFG may, under certain conditions, conduct recreational spring chinook salmon fisheries in 2002 and remaining years on the permit (Figure 1). The proposed changes would occur under the IDFG Anadromous Salmon Sport Fishing regulations and would include recreational spring/summer chinook salmon fisheries in the lower Salmon River and Snake River as well as expanding the open waters in the Little Salmon River and Clearwater River basin (IDFG 2001a). These fisheries, summarized below, would be directed at marked, hatchery-origin fish that are not part of the listed Snake River spring/summer chinook salmon ESU.



**Figure 1.** Snake River Basin (excluding areas upstream of Hells Canyon Dam). Shading indicates locations of proposed additional or extended salmon fishery areas.

### 2.2.1 Annual Review and Reauthorization of Permit

NOAA Fisheries is proposing to amend permit 1233 to apply the annual review and approval provisions currently in place for the South Fork Salmon River to the remainder of the chinook salmon recreational fisheries conducted by the IDFG (see Section 2.4, Special Conditions below). The intent of this modification is to align the remainder of the Idaho recreational chinook salmon fisheries with permit conditions currently in effect associated with the annual approval of the South Fork Salmon River fishery. Annual approval of the recreational fisheries will be based on a sliding scale that provides for proportionately smaller incidental take in years of reduced natural fish returns. The proposed sliding scale and an example of its application to the 2002 chinook run is contained in sections 5.5 and 5.6 of this Opinion.

Permit 1233 will be amended by adding the following to Section A., Level of Incidental Take, Anadromous Salmon Fishing Regulations:

- 2. Snake River, lower Salmon River, Rapid River/Little Salmon River and Clearwater River: Annual incidental take caps will be determined in any year that a fishery is approved by NOAA Fisheries based on the following sliding scale:**

<b>Lower Granite Dam Predicted Return of Naturally Produced Listed Spring Chinook</b>	<b>Proposed Maximum Percent of Naturally produced Run Mortality for IDFG Recreational Fishery</b>	<b>Range of Potential Incidental Mortalities (number of fish)</b>	<b>Estimated Total Take (catch and release)</b>
< 2,800	0%	0	-
2,800 to 4,500	0.25%	7 - 11	70-110
4,501 to 10,000	0.5%	22 - 50	220-500
10,001 to 15,000	0.75%	75 - 112	750-1,120
15,001 to 20,000	1.0%	150 - 200	1,500-2,000
20,001 to 25,000	1.5%	300 - 375	3,000-3,750
> 25,001	2.0%	> 500	>5000

**NOAA Fisheries will review the predicted return of non-listed, hatchery-produced, adult salmon as well as the predicted return of ESA-listed hatchery and naturally-produced salmon, the proposed fishing regulations, and incidental take quotas. The IDFG fishery, in conjunction with other fisheries proposed by treaty Tribes, must be in compliance with total incidental take limits and harvest sharing agreements for that year. The annual incidental take cap will be based on the projected annual run size, analysis of impacts to listed species and consultation between IDFG and NOAA Fisheries (see Operational Reports and Notification Requirements D.1).**

### **2.2.2 Expanded Area – Clearwater River**

Chinook fishing in the Clearwater River basin occurs from mid-April until either the annual harvest quota is reached or August 7, whichever comes first, and is targeted at unlisted surplus fish returning to the Dworshak National Fish Hatchery, Kooskia National Fish Hatchery, and several remote satellite facilities operated in conjunction with Clearwater Fish Hatchery. The current permit covers fishing in the North Fork Clearwater River from its mouth upstream to Dworshak Dam at river mile 1.8, the Clearwater River from the Memorial Bridge at Lewiston,

Idaho (river mile 2.6) upstream to about river mile 100, and portions of the South Fork Clearwater River and the Lochsa River. The proposed boundary modifications would move the downstream boundary on the Clearwater River to the Camas Prairie Railroad Bridge (river mile 1.3) and extend the open fishing area on the South Fork Clearwater to include approximately 20 additional miles upstream to its origin at the confluence of Red and American Rivers and the open area on the Lochsa River upstream to its origin at the confluence of Crooked Fork and Colt Killed Creek.

### **2.2.3 Expanded Area – Little Salmon River**

The Little Salmon River recreational chinook salmon fishery occurs from approximately mid-April until either the quota is reached or August 7, whichever comes first, and is targeted at unlisted, surplus, hatchery-produced fish returning to Rapid River Fish Hatchery which is located on a tributary of the Little Salmon River. The current permit covers fishing in the Little Salmon River from 0.5 mile upstream of its mouth upstream to the mouth of Rapid River, a distance of about 4 miles. This modification would expand the open fishing area to include the Little Salmon River from its mouth upstream to Smokey Boulder Bridge, a distance of about 25 miles.

### **2.2.3 Expanded Area – Salmon River**

A lower Salmon River chinook salmon fishery is proposed from approximately mid-April until either the annual quota is reached or mid June, whichever comes first, and is targeted at surplus, unlisted, hatchery-produced fish returning to Rapid River Fish Hatchery. The fishery is proposed to take place in the Salmon River from Hammer Creek upstream to the mouth of the Little Salmon River, a distance of about 30 miles.

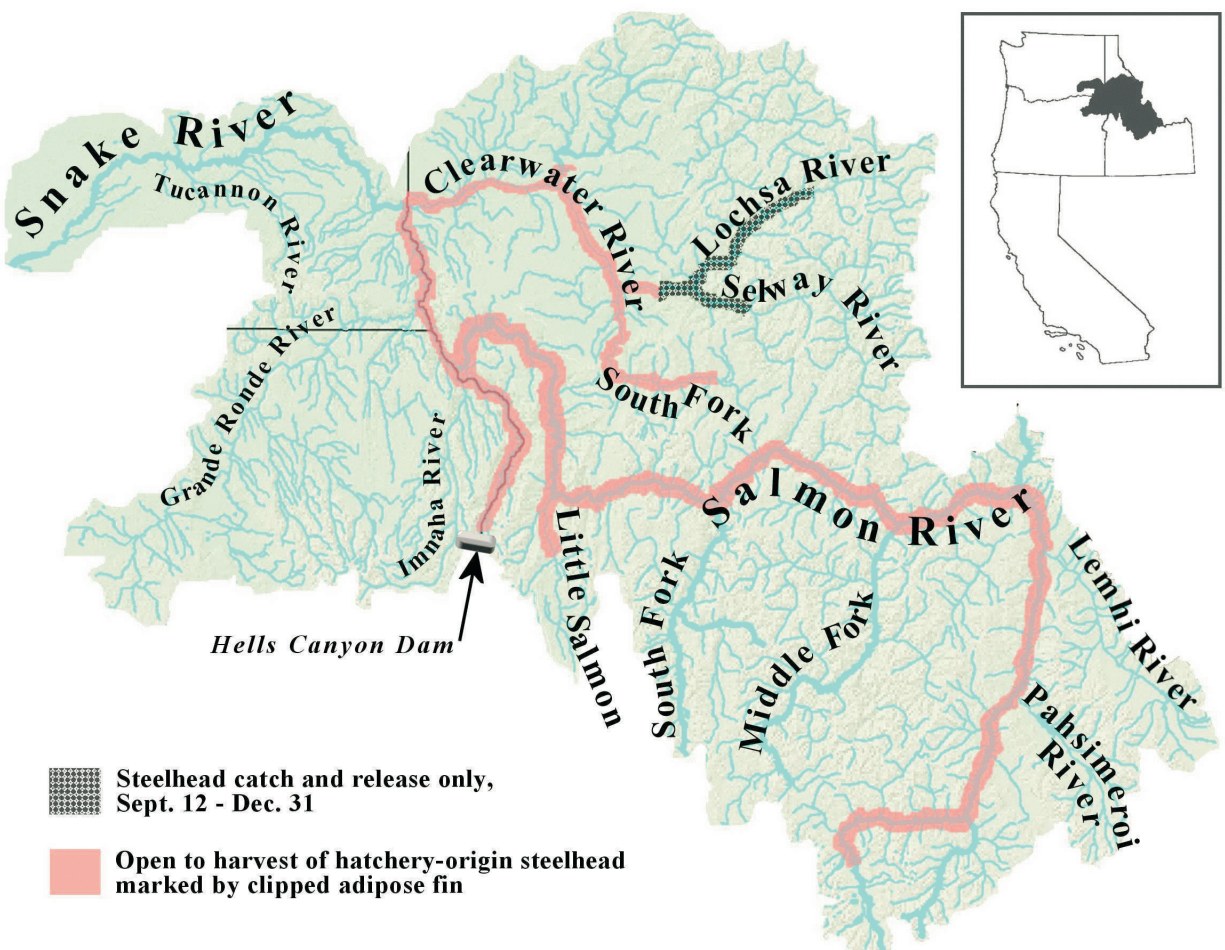
### **2.2.4 Additional Area – Snake River**

Two sections of the main-stem of the Snake River are proposed to be added to waters open to fishing for spring chinook salmon. The first area is in the Snake River upstream from the Imnaha River to Hells Canyon Dam, and would occur from mid-April until either the quota is reached or August 7, whichever comes first. The fishery would target unlisted fish of the Rapid River stock returning to Hells Canyon Dam. The fishery would take place in the Snake River from a posted boundary at Dug Bar, six miles upstream from the mouth of the Imnaha River upstream to Hells Canyon Dam, a distance of about 55 miles. This section of the Snake River forms a portion of the state boundary between Idaho and Oregon.

The second proposed area is from the Southway Bridge between Lewiston, Idaho and Clarkston, Washington upstream approximately 23 miles to the Heller Bar boat ramp (about 0.7 miles downstream from the mouth of the Grande Ronde River). This section of the Snake River forms a portion of the state boundary between Idaho and Washington. This fishery is proposed to occur between mid-April and late-May and also is designed to intercept the early-arriving hatchery-produced fish of Rapid River hatchery stock.

### 2.3 Proposed take authorization for steelhead

NOAA Fisheries is proposing to amend permit 1233 to authorize incidental take of juvenile and adult threatened Snake River Basin steelhead in spring/summer chinook fisheries managed by the IDFG under Anadromous Salmon Regulations and in fisheries targeting resident fish species managed by the IDFG under General Fishing Regulations (Figure 2). The steelhead take authorization addressed in this opinion does not constitute a change in the amount or type of take that has occurred in past years. The biological opinion on the original issuance of permit 1233 evaluated the impacts of resident species fishing and anadromous salmon fishing on steelhead, but no take authorization was included because take prohibitions had not been promulgated. Take authorization for adult steelhead will be covered in this action while take authorization for juvenile steelhead affected by resident species fisheries will be covered in an FMEP developed under section 4(d) of the ESA.



**Figure 2.** Snake River Basin (excluding areas upstream of Hells Canyon Dam). Shading indicates locations of proposed steelhead fishery areas.

## 2.4 Modifications to Special Conditions of Permit

To address the above described modifications, NOAA Fisheries proposes to add parts to Section B., Special Conditions in **bold** (as they would appear in the modified permit):

1. Spring/summer chinook salmon fishing must not continue after August 7 of any year in the **Snake River upstream of Dug Bar (approximately 5 miles upstream of the Imnaha River) to Hells Canyon Dam**, Little Salmon River or in the Clearwater River to ensure that a take of threatened Snake River fall chinook salmon is not likely to occur.
2. **Spring/summer chinook salmon fishing in the Snake River (Southway Bridge between Lewiston, Idaho and Clarkston, Washington to Heller Bar boat ramp approximately 0.7 miles downstream of the Grande Ronde River) must not continue past the end of May of any year in which fisheries occur in this area, to protect later running wild spring/summer chinook salmon.**
3. **Spring/summer chinook salmon fishing in the lower main-stem Salmon River must not continue past the middle of June of any year in which fisheries occur in this area to protect later running wild spring/summer chinook salmon.**
4. The **Snake River, lower Salmon River, Rapid River/Little Salmon River, Clearwater River and South Fork Salmon River** **spring/summer chinook** fisheries are subject to **annual** approval by the **NOAA Fisheries**. **NOAA Fisheries approval will be in the form of a letter from the Chief, Hatchery and Inland Fisheries Branch, after NOAA Fisheries receives a description from IDFG of the projected return numbers and harvest management intentions (see Operational Reports and Notification Requirements section D-1), and finds that year's proposed management consistent with this permit.** In a year when the respective fishery is approved, the fishery must be terminated when the annual quota is achieved, the authorized annual mortality level of ESA-listed adult fish is reached, or **annual specified termination date**, whichever occurs first.
5. The IDFG must manage recreational fisheries to limit the incidental harvest of ESA-listed spring/summer chinook salmon, fall chinook salmon, **steelhead** and sockeye salmon to the levels described in the permit application. The IDFG must make use of its in-season monitoring information to watch for opportunities to shape the fishery in the **Snake River, lower Salmon River, Clearwater River, South Fork Salmon River and Little Salmon River** to reduce proportional impacts on ESA-listed natural-origin chinook salmon.

6. The IDFG must maintain law enforcement and public information programs to enhance the protection of ESA-listed fish and to ensure compliance with ESA-listed fish protective regulations. The IDFG must:
  - a) Continue to provide public education and information materials that emphasize the importance of protecting ESA-listed anadromous fish species;
  - b) participate with co-managers and land management agencies to provide warning signs that will direct citizens to avoid disturbing salmon that are spawning and to avoid wading or boating activities that may damage redds. The signs should also explain the legal and biological consequences of harassing or harming ESA-listed fish;
  - c) provide law enforcement patrols focused on times and areas where ESA-listed anadromous fish may be vulnerable to illegal harvest or harassment; and
  - d) restrict fishing activities and/or increase enforcement emphasis at any time or place that is identified during fisheries monitoring as exhibiting a potential hazard to ESA-listed fish.
7. The IDFG must take measures to prevent incidental take of ESA-listed fish by informing fishers on subjects such as differentiating ESA-listed from non-listed fish, avoiding redds, and methods for releasing non-target fish alive. Actions shall also be taken to identify and protect, through warning signs or other means, ESA-listed fish critical spawning areas. A summary of public education efforts must be provided in annual reports (see Permit Report and Reauthorization Requirement C.4.).
8. The IDFG must take measures to reduce deliberate illegal takes of ESA-listed fish. The IDFG's field biologists and conservation officers, through the IDFG, shall report illegal takes of ESA-listed adult and juvenile salmon to **NOAA Fisheries** (see Operational Reports and Notification Requirement D.5.).
9. The IDFG must monitor recreational fisheries for the incidental catch of ESA-listed **steelhead**, sockeye and chinook salmon. The IDFG must continue to conduct creel surveys. Included in the surveys shall be the numbers of hatchery-marked and unmarked fish caught by anglers. Appropriate techniques shall be employed to determine whether unmarked fish were of hatchery or natural origin. Sampling all recreational fisheries that may result in incidental takes of ESA-listed fish for catch composition, including the collection of biological information, must also continue at levels comparable to those in recent years and must be increased where necessary to insure a thorough post-season analysis of fishery impacts on ESA-listed species. IDFG personnel shall conduct creel surveys or other forms of angler contact to monitor the possible incidence of illegal harvest activity. Results of monitoring efforts and creel surveys must be

reported to **NOAA Fisheries** on an annual basis (see Permit Reporting and Reauthorization Requirement C.7.).

10. The IDFG must conduct the following monitoring activities associated with the kokanee fishery in Redfish Lake, as stated in the IDFG's conservation plan:
  - a) interview anglers at lake access points weekly,
  - b) collect fishery information from local businessmen and campground hosts,
  - c) conduct spot checks (with enforcement personnel) on the water and at lake access points,
  - d) collect adipose fins from up to 100 creeled kokanee throughout the fishing season for mitochondrial DNA analysis, and
  - e) post signs and release bulletins to the local media to alert anglers to the presence of adipose fin-clipped hatchery sockeye salmon in Redfish Lake.

**11. IDFG must provide the NOAA Fisheries with an analysis of their proposed spring fishery by March 15 of each year.**

## **2.5 Action Area**

The action area for the proposed fishery actions is as follows:

Spring Chinook – The mainstem Snake River, Clearwater Basin, lower mainstem Salmon River, and Little Salmon River.

Steelhead – The mainstem Snake River beginning at Lewiston, Idaho to Hells Canyon Dam, Clearwater Basin, and mainstem Salmon River.

## **3.0 Status of Species and Critical Habitat**

### **3.1 Status of Species**

NOAA Fisheries has determined that the actions being considered in this biological opinion may affect the following species under NOAA Fisheries' jurisdiction, that are protected under the ESA: Snake River sockeye salmon (*Oncorhynchus nerka*) Snake River spring/summer chinook salmon and fall chinook salmon (*O. tshawytscha*), and Snake River steelhead trout (*O. mykiss*). The following sections provide a brief summary of the current status of each affected ESU. More complete descriptions may be found in the biological opinions on issuance of permit 1233 (NMFS 2000a) and Federal Columbia River Power System (NMFS 2000b).

#### **3.1.1 Snake River sockeye salmon**

The Snake River sockeye salmon ESU, listed as endangered on November 20, 1991 (56 FR 58619), includes populations of sockeye salmon from the Snake River basin, Idaho. The extant populations occur only in three lakes located in Stanley Basin in the upper Salmon River drainage and in a captive brood stock program operated by the NOAA Fisheries and the IDFG. Under NOAA Fisheries' interim policy on artificial propagation (April 5, 1993, 58 FR 17573),

the progeny of fish from a listed population that are propagated artificially are considered part of the listed species and are protected under the ESA. Thus, although not specifically designated in the 1991 listing, Snake River sockeye salmon produced in the captive broodstock program are included in the listed ESU. Given the dire status of the wild population under any criteria, NOAA Fisheries considers the captive broodstock and its progeny essential for recovery. Critical habitat, which includes the nursery lakes in the upper Salmon River drainage and the migration route in the Snake and Salmon Rivers, was designated for Snake River sockeye salmon on December 28, 1993 (58 FR 68543).

Snake River sockeye salmon adults enter the Columbia River primarily during June and July. Arrival at Redfish Lake, which now supports the only remaining indigenous run of Snake River sockeye salmon, peaks in August and spawning occurs primarily in October (Bjornn *et al.* 1968). The population level was enumerated at 16 wild and 264 hatchery-produced adults returning to the Stanley basin between 1990 and 2000. NOAA Fisheries considers the risk of extinction to be very high.

### **3.1.2 Snake River fall chinook salmon**

The Snake River fall chinook salmon ESU, listed as threatened on April 22, 1992 (67 FR 14653), includes all natural-origin populations of fall chinook in the mainstem Snake River and several tributaries including the Tucannon, Grande Ronde, Salmon, and Clearwater Rivers. Fall chinook from the Lyons Ferry Hatchery are included in the ESU but are not listed. Critical habitat, which includes all waters of the Snake River basin used by fall chinook, was designated for Snake River fall chinook salmon on December 28, 1993 (58 FR 68543).

The spawning grounds between Huntington (river mile 328) and Auger Falls (river mile 607) were historically the most important for this species. Only limited spawning activity was reported downstream from river mile 273 (Waples *et al.* 1991), about one mile upstream of Oxbow Dam. Snake River fall chinook are currently limited to the area below Hells Canyon Dam (river mile 247). Adult Snake River fall chinook salmon enter the Columbia River in July, migrate into the Snake River from August through October and generally spawn from October through November.

There are no reliable estimates of historical population sizes of Snake River fall chinook salmon. The mean number of adults was estimated to have declined from 72,000 in the 1930s and 1940s to 29,000 during the 1950s. In spite of these declines, the Snake River was the most important area of natural production of fall chinook in the Columbia River through the 1950s. The number of adults counted at the uppermost Snake River mainstem dams averaged 12,720 total spawners from 1964 to 1968, 3,416 spawners from 1969 to 1974, and 610 spawners from 1975 to 1980 (Waples *et al.* 1991). Counts of natural origin spawners continued to decline through the 1980s when they reached a low of 78 in 1990. Since 1990, returns of natural-origin fish to Lower Granite Dam have been variable, but increasing with 797 in 1997 and 306 in 1998. At the present time, numbers of naturally spawning fall chinook are increasing in the Snake River

primarily due to supplemental releases of Lyons Ferry hatchery juveniles. The success of natural reproduction from these hatchery-produced returnees is uncertain.

The Northwest Fisheries Science Center recently considered the extinction risk for Snake River fall chinook salmon as part of their Cumulative Risk Initiative. The results of these analyses indicate that the probability of extinction for Snake River fall chinook over the next ten years is near zero while the risk of extinction over 100 years is between 6-17% (depending on whether 1980 is included in the baseline analysis).

### **3.1.3 Snake River steelhead**

Information on general steelhead biology can be found in NMFS (2002a), NMFS (2000b), and Busby *et. al* (1996).

Sneke River steelhead were listed as threatened under the ESA in 1997. Snake River basin steelhead are an inland species that occupy the Snake River basin of southeast Washington, northeast Oregon, and Idaho. Historically, steelhead ascended the Snake River up to Rock Creek (river mile 704), but have been limited to below Hells Canyon Dam (river mile 247) since 1964. The Snake River historically supported more than 55 percent of total natural-origin production of steelhead in the Columbia River basin. It now has approximately 63 percent of the basin's natural production potential (Mealy 1997). The current spawning range of this species include the Salmon, Pahsimeroi, Lemhi, Selway, Clearwater, Wallowa, Grande Ronde, Imnaha, and Tucannon Rivers.

Sneke River steelhead, like most inland steelhead, are "summer-run" which means they enter freshwater nine or ten months before spawning. Snake River steelhead enter fresh water from June to October and spawn in the following spring from March to May. The two components, A-run and B-run, are distinguished by their size, timing of their respective adult migrations, and ocean-age. The B-run steelhead occupy four major subbasins, including two on the Clearwater River (Lochsa and Selway) and two on the Salmon River (Middle Fork and South Fork), areas that are for the most part not occupied by A-run steelhead. Some natural B-run steelhead are also produced in parts of the mainstem Clearwater and its major tributaries. The A-run steelhead are widely distributed throughout the remaining available habitat.

No estimates of historical (pre-1960s) abundance specific to Snake River steelhead are available. In general, steelhead abundance declined sharply in the early 1970s, rebuilt modestly from the mid-1970s through the 1980s, and declined again during the 1990s. Although, the total (hatchery + natural) run size has increased since the mid-1970s, the majority of natural stocks have been declining. Parr densities in natural production areas have been substantially below estimated capacity in recent years. Downward trends in the 1990s and low parr densities indicate a particularly sever problem for B-run steelhead, whose loss would substantially reduce life history diversity of Snake River Basin steelhead.

The longest consistent indicator of steelhead abundance in the Snake River basin is derived from counts of natural-origin steelhead at the uppermost dam on the lower Snake River. According to these estimates, the abundance of natural-origin summer steelhead at the uppermost dam on the Snake River declined from a 4-year average of 58,300 in 1964 to a 4-year average of 8,300 ending in 1998. More recently, natural-origin summer steelhead abundance has increased with the 1999 to 2001 average being 26,600.

### **3.1.4 Snake River spring/summer chinook salmon**

The Snake River spring/summer chinook salmon ESU, listed as threatened on April 22, 1992 (67 FR 14653), includes all natural-origin populations in the Tucannon, Grande Ronde, Imnaha, and Salmon Rivers. Spring/summer chinook salmon returning to the Clearwater River basin are not listed nor included in the listed ESU. At the time of listing, NOAA Fisheries determined that spring/summer chinook in the Clearwater River are progeny of hatchery-produced salmon that were reintroduced after the indigenous native stock was extirpated by impassable dams. Some or all of the fish returning to several of the hatchery programs are also listed, including those returning to the Tucannon, Imnaha, and Grande Ronde River hatcheries, and to the Sawtooth, Pahsimeroi, and McCall hatcheries on the Salmon River. Critical habitat was designated for Snake River spring/summer chinook salmon on December 28, 1993 (58 FR 68543) and was revised on October 25, 1999 (64 FR 57399).

The present range of spawning and rearing habitat for naturally-spawned Snake River spring/summer chinook salmon is primarily limited to the Salmon, Grande Ronde, Imnaha, and Tucannon subbasins. Most Snake River spring/summer chinook salmon enter individual subbasins from May through September.

In the late 1800s, the population of wild, adult Snake River spring/summer chinook salmon was estimated at more than 1.5 million adults. By the 1950s, the population had declined to an estimated 125,000 adults and continued to decline through the 1970s. Returns were variable through the 1980s, but declined further in the 1990s. Record low returns were observed in 1994 and 1995 after which a modest increase occurred through 2000. In 2001 there was a substantial increase in natural escapement.

The predicted 2002 return of spring/summer chinook salmon is the second largest to the Snake River basin in the past 30 years and consists primarily of non-listed, hatchery-produced salmon. The Columbia River-mouth prediction for the Snake River component is predicted to be 166,800 fish compared to 206,700 in 2001, and 52,200 in 2000 (C. LeFleur, *U.S. v. Oregon* Technical Advisory Committee (TAC) Chair, November 21, 2000; IDFG 2002b). Historical databases summarizing escapement into the Snake River basin provide estimates for the spring and summer chinook salmon components. Table 1 summarizes the estimated annual return of adult, natural-origin Snake River spring and summer chinook returning to Lower Granite Dam since 1979. The projected 2002 return of naturally produced fish estimated by TAC is approximately 24,100 spring chinook salmon and 5,300 summer chinook salmon (spring/summer chinook salmon total of 29,400).

The Northwest Fisheries Science Center has recently considered the extinction risk for Snake River spring/summer chinook salmon as part of their Cumulative Risk Initiative, which was based on seven “index” populations (out of a total of 35 to 40 populations). Two populations have a 10 percent risk of declining to one individual in ten years, four populations have 56 to 88 percent risk of declining to one individual in 100 years, and the remaining populations have more than 30 percent probability of declining to this level within 100 years if nothing changes.

Table 1. Estimates of natural-origin Snake River spring/summer chinook salmon counted at Lower Granite Dam (TAC 2002).

Year	Spring Chinook	Summer Chinook	Total
1979	2,573	2,714	5,287
1980	3,478	2,404	5,882
1981	7,941	2,739	10,680
1982	7,117	3,531	10,648
1983	6,181	3,219	9,400
1984	3,199	4,229	7,428
1985	5,245	2,696	7,941
1986	6,895	2,684	9,579
1987	7,883	1,855	9,738
1988	8,581	1,807	10,388
1989	3,029	2,299	5,328
1990	3,216	3,342	6,558
1991	2,206	2,967	5,173
1992	11,134	441	11,575
1993	5,871	4,082	9,953
1994	1,416	183	1,599
1995	745	343	1,088
1996	1,358	1,916	3,274
1997	2,126	5,137	7,263
1998	5,089	2,913	8,002
1999	1,104	1,584	2,688
2000	3,266	846	4,112
2001	16,477	2,400	18,877
2002 <sup>1</sup>	24,100	5,300	29,400
Recovery Escapement Levels (counted at Ice Harbor Dam)			31,440

<sup>1</sup> *preseason estimate, March 15, 2002*

### **3.2 Critical Habitat**

Critical habitat encompasses accessible reaches of all rivers (including estuarine areas and tributaries) within the range of each listed ESU. Critical habitat includes all waterways, substrate, and adjacent riparian zones below longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years). Critical habitat for Snake River sockeye salmon, Snake River spring/summer chinook salmon and Snake River fall chinook salmon was designated on December 28, 1993 (58 FR 68543). Critical habitat for Snake River Basin steelhead was designated February 16, 2000 (65 FR 68543). Critical habitat for Snake River Basin steelhead was designated February 16, 2000 (65 FR 7764); this designation was vacated by the District of Columbia District Court and remanded to NOAA Fisheries for new rulemaking pursuant to a court order in May, 2002. However, the proposed harvest activities will still take place in the area that was originally designated as critical habitat. Thus, in the absence of a new rule designating critical habitat for Snake River steelhead, this consultation will include an evaluation of the effects of the proposed actions on the species' habitat to determine whether those actions are likely to jeopardize the species' continued existence. More detailed habitat information (i.e., specific watersheds and habitat features and special management considerations) for the Snake River Basin steelhead ESU can be found in the critical habitat designation which was vacated and remanded to NOAA Fisheries.

Essential features include adequate (1) substrate (especially spawning gravel), (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) migration conditions (see 58 FR 68546, December 29, 1993 for Snake River salmon). These features are nearly identical to those characterized as Essential Fish Habitat (EFH) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (PFMC 1999).

### **4.0 Environmental Baseline**

The environmental baseline for this consultation is the result of several forms of activities, summarized below, that affect the survival and recovery of Snake River sockeye salmon, Snake River spring/summer chinook salmon, Snake River fall chinook salmon, and Snake River steelhead. The biological requirements of Snake River sockeye salmon, Snake River spring/summer chinook salmon, Snake River fall chinook salmon, and Snake River steelhead are currently not being met under their respective environmental baselines. Their status is such that there must be a substantial improvement in the environmental conditions of the species' respective habitats (over those currently available under the environmental baselines). Any further degradation of the environmental conditions would have a considerable impact due to the amount of risk the species presently face under the environmental baselines. In addition, there must be improvements to minimize impacts due to hydro power dams, incidental harvest, hatchery practices, and unfavorable estuarine and marine conditions.

The best scientific information presently available suggests that a multitude of factors, past and present, have contributed to the decline of West Coast salmonids. NOAA Fisheries reviewed much of that information in its recent consultation on operation of the Federal Columbia River Power System (FCRPS) (NMFS 2000b), and that review is summarized here. NOAA Fisheries recognizes that natural environmental fluctuations have likely played a role in the species' recent declines. However, NOAA Fisheries believes that other human-induced impacts (e.g., harvest in certain fisheries, artificial propagation, water diversions, and widespread habitat modification) have played an equally important role in the decline of these species.

#### **4.1 The Species' Biological Requirements in the Action Areas**

The action area for this consultation includes portions of the Clearwater River drainage, mainstem Snake River upstream from Lewiston, Idaho, the lower Salmon River downstream from the Little Salmon River, and the Little Salmon River for chinook fisheries (see Figure 1). The action area for steelhead fisheries includes portions of the Clearwater Basin, mainstem Snake River, and mainstem Salmon River (see Figure 2).

SNAKE River sockeye salmon, SNAKE River spring/summer chinook salmon, SNAKE River fall chinook salmon, and SNAKE River steelhead reside in, or migrate through, the action areas considered in this consultation. The biological requirements during the species' life history stages can be obtained by identifying the essential features of their critical habitat. Essential features include adequate: (1) substrate (especially spawning gravel), (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) migration conditions (NMFS 2000a). These have been fully discussed in recent biological opinions (NOAA 2000a, NOAA 2000b, NOAA 2002) and what follows is a brief summary of the factors that affect these requirements in the action areas.

#### **4.2 Factors Affecting the Species in the Action Areas**

##### *4.2.1 Hydro power System Effects on the Baseline*

Anadromous salmonids in the Columbia River basin have been dramatically affected by the development and operation of the FCRPS on the lower Snake and Columbia Rivers. Storage dams have eliminated spawning and rearing habitat and have altered the natural hydro graph of the Snake and Columbia Rivers, decreasing spring and summer flows and increasing fall and winter flows. Power operations cause flow levels and river elevations to fluctuate, affecting fish movement through reservoirs and riparian ecology, and stranding fish in shallow areas. The dams in the migration corridor alter smolt and adult migrations. Smolts experience a high level of mortality passing the dams. The dams also have converted the once-swift river into a series of slow-moving reservoirs, slowing the smolts' journey to the ocean and creating habitat for predators. Water velocities throughout the migration corridor now depend far more on volume runoff than before the development of the mainstem reservoirs.

There have been numerous changes in the operation and configuration of the FCRPS as a result of ESA consultations between NOAA Fisheries and the Bonneville Power Administration (B.A.), the U.S. Army Corps of Engineers (Corps), USFWS, and the Bureau of Reclamation (BOR). The changes have improved survival for the ESA-listed fish migrating through the Snake and Columbia Rivers. Increased spill at the dams allows smolts to avoid both turbine intakes and bypass systems. Increased flow in the mainstem Snake and Columbia Rivers reduces in river travel time for smolts. The transportation of smolts from the Snake River has also benefitted by operational improvements such as addition of new barges and modification of existing barges. In addition to spill, flow, and transportation improvements, the Corps implemented numerous other changes to project operations and maintenance at all FCRPS dams on the Snake and Columbia Rivers.

It is possible to quantify the survival benefits accruing from many of these strategies for each of the ESA-listed anadromous fish ESUs. For Snake River spring/summer chinook salmon smolts migrating in river, the estimated survival through the hydro system is now between 40 percent and 60 percent, compared with an estimated survival rate during the 1970s of 5 percent to 40 percent. Snake River steelhead have probably reacted similarly because their life history and run timing are similar to those of spring/summer chinook salmon (NMFS 2000b). It is more difficult to obtain direct data and compare survival for fish transported from the Snake River, but there are likely to be improvements for transported fish as well. It is reasonable to expect that the recent changes in operation and configuration of the FCRPS will benefit all ESA-listed Columbia River basin salmonids and that the benefits will likely be greater the farther upriver the ESU. However, further improvements are necessary because the Federal hydro system continues to cause a considerable level of mortality for some ESUs.

#### *4.2.2 Habitat Effects on the Baseline*

The quality and quantity of freshwater habitat in much of the Columbia River basin have declined dramatically in the last 150 years. Forestry, agriculture, road construction, hydro system development, mining, and urbanization have radically changed the quality and reduced the quantity of historical habitat conditions of the basin. With the exception of fall chinook, which generally spawn and rear in the mainstem rivers, salmon and steelhead spawning and rearing habitat is found in the tributaries to the Snake and Columbia Rivers. Anadromous fish typically spend from a few months to three years rearing in freshwater tributaries. Depending on the species, they spend from a few days to an extended period of time in the Columbia River estuary before migrating out to the ocean. They spend another one to four years in the ocean before returning as adults to spawn in their natal streams.

Water quality in streams throughout the Columbia River basin has been degraded by human activities such as dams and diversion structures, water withdrawals, farming and animal grazing, road construction, timber harvest activities, mining activities, and urbanization. Over 2,500 streams and river segments and lakes do not meet Federally-approved, state and Tribal water quality standards and are now listed as water-quality-limited under Section 303(d) of the Clean

Water Act. Tributary water quality problems contribute to poor water quality where sediment and contaminants from the tributaries settle in mainstem reaches and the estuary.

Most of the water bodies in Oregon, Washington, and Idaho that are on the 303(d) list do not meet water quality standards for temperature. Temperature alterations affect salmonid metabolism, growth rate, and disease resistance, as well as the timing of adult migrations, fry emergence, and smoltification. Many factors can cause high stream temperatures, but they are primarily related to land-use practices rather than point-source discharges. Some common actions that result in high stream temperatures are the removal of trees or shrubs that directly shade streams, excessive water withdrawals for irrigation or other purposes, and warm irrigation return flows. Loss of wetlands and increases in groundwater withdrawals have contributed to lower base-stream flows, which in turn contribute to temperature increases. Channel widening and land uses that create shallower streams also cause temperature increases.

Pollutants also degrade water quality. Salmon require clean gravel for successful spawning, egg incubation, and the emergence of fry. Fine sediments clog the spaces between gravel and restrict the flow of oxygen-rich water to the incubating eggs. Excess nutrients, low levels of dissolved oxygen, heavy metals, and changes in pH also directly affect the water quality for salmon and steelhead.

Water quantity problems are also a key cause of habitat degradation and reduced fish production. Millions of acres of land in the basin are irrigated. Although some of the water withdrawn from streams eventually returns as agricultural runoff or groundwater recharge, crops consume a large proportion. Withdrawals affect seasonal flow patterns by removing water from streams in the summer (mostly May through September) and restoring it to surface streams and groundwater in ways that are difficult to measure. Withdrawing water for irrigation, urban, and other uses can increase temperatures, smolt travel time, and sedimentation. Return water from irrigated fields can introduce nutrients and pesticides into streams and rivers.

On a larger landscape scale, human activities have affected the timing and amount of peak water runoff from rain and snowmelt. Forest and range management practices have changed vegetation types and density, which can affect the timing and duration of runoff. Many riparian areas, flood plains, and wetlands that once stored water during periods of high run off have been developed. Urbanization paves over or compacts soil and increases the amount and pattern of runoff reaching rivers and streams.

Blockages that stop the downstream and upstream movement of fish exist at many agricultural, hydro system, municipal/industrial, and flood control dams and barriers. Highway culverts that are not designed for fish passage also block upstream migration. Migrating fish are diverted into unscreened or inadequately screened water conveyances or turbines, resulting in unnecessary mortality. While many fish-passage improvements have been made in recent years, manmade structures continue to block migrations or kill fish throughout the basin.

Land ownership has played a part in habitat and land-use changes. Federal lands, which compose 50 percent of the basin, are generally forested and influence upstream portions of the watersheds. While there is substantial habitat degradation across all ownerships, in general, habitat in many headwater stream sections is in better condition than in the largely non-Federal lower portions of tributaries (Doppelt *et al.* 1993; Frissell 1993; Henjum *et al.* 1994; Quigley and Arbelbide 1997). In the past, valley bottoms were among the most productive fish habitats in the basin (Stanford and Ward 1992, Spence *et al.* 1996, ISG 1996). Today, agricultural and urban land development and water withdrawals have considerably altered the habitat for fish and wildlife. Streams in these areas typically have high water temperatures, sedimentation problems, low flows, simplified stream channels, and reduced riparian vegetation.

Mainstem habitats of the Columbia and Snake Rivers have been affected by impoundments that have inundated large amounts of spawning and rearing habitat. Historically, fall chinook salmon spawned in the mainstem near The Dalles, Oregon, upstream to the Pend Oreille River in Washington and in the Snake River downstream of Shoshone Falls. Current mainstem production areas for fall chinook salmon are mostly confined to the Hanford Reach of the mid-Columbia River, mainstem Columbia River downstream from Bonneville Dam, and to the Hells Canyon Reach of the Snake River, with minor spawning populations elsewhere in the mid-Columbia River, and below the lower Snake River dams. Mainstem habitat in the Columbia and Snake Rivers has been reduced, for the most part, to a single channel, floodplains have been reduced in size, off-channel habitat features have been lost or disconnected from the main channel, and the amount of large woody debris (large snags/log structures) in rivers has been reduced. Most of the remaining habitats are affected by flow fluctuations associated with reservoir management.

The Columbia River estuary has also been changed by human activities. Navigation channels have been dredged, deepened and maintained, jetties and pile-dike fields have been constructed to stabilize and concentrate flow in navigation channels, marsh and riparian habitats have been filled and diked, and causeways have been constructed across waterways. Artificial islands have been constructed that now support some of the world's largest colonies of piscivorous birds. These actions have decreased the width of the mouth of the Columbia River to two miles and increased the depth of the Columbia River channel at the bar from less than 20 to more than 55 feet. More than 50 percent of the original marshes and spruce swamps in the estuary have been converted to industrial, transportation, recreational, agricultural, or urban uses. More than 3,000 acres of intertidal marsh and spruce swamps have been converted to other uses since 1948 (LCREP 1999). Many wetlands along the shore in the upper reaches of the estuary have been converted to industrial and agricultural lands after levees and dikes were constructed. Furthermore, water storage and release patterns from reservoirs upstream of the estuary have changed the seasonal pattern and volume of discharge. The peaks of spring/summer floods have been reduced, and the amount of water discharged during winter has increased.

The Basinwide Recovery Strategy (Federal Caucus 2000) outlines a broad range of current programs designed to improve habitat conditions for anadromous fish. Because most of the

basin's anadromous fish spawning habitat is in Federal ownership, Federal land management programs are of primary importance. Examples of Federal actions likely to affect salmonids in the ESA-listed ESUs include authorized land management activities of the USFS and Bureau of Land Management (BLM). Federal actions, including the Corps' section 404 permitting activities under the Clean Water Act, the Corps' permitting activities under the River and Harbors Act, National Pollution Discharge Elimination System permits issued by EPA, highway projects authorized by the Federal Highway Administration, Federal Energy Regulatory Commission licenses for non-Federal development and operation of hydropower, and Federal hatcheries may result in impacts to ESA-listed anadromous fish.

Several recovery efforts are underway that may slow or reverse the decline of salmon and steelhead populations. Notable efforts within the range of the Snake River salmonid ESUs are the Northwest Forest Plan (NFP), PACFISH, Washington Wild Stock Restoration Initiative, and Washington Wild Salmonid Policy. PACFISH is an ecosystem-based aquatic habitat and riparian-area management strategy that covers the majority of the basin accessible to anadromous fish and includes specific prescriptions designed to halt habitat degradation. PACFISH provides objectives, standards, and guidelines that are applied to all Federal land management activities such as timber harvest, road construction, mining, grazing, and recreation. USFS and BLM implemented PACFISH beginning in 1995. Several other efforts are also being carried forward by NOAA Fisheries, USFS, and BLM. These components include implementation of monitoring, a system of watersheds that are prioritized for protection and restoration, improved and monitored grazing systems, road system evaluation and planning requirements, mapping and analysis of unroaded areas, multi-year restoration strategies, and batching and analyzing projects at the watershed scale.

The most substantive element of the NFP for anadromous fish is its Aquatic Conservation Strategy (ACS), a regional-scale aquatic ecosystem conservation strategy that includes: (1) Special land allocations (such as key watersheds, riparian reserves, and late-successional reserves) to provide aquatic habitat refugia; (2) special requirements for project planning and design in the form of standards and guidelines; and (3) new watershed analysis, watershed restoration, and monitoring processes. These components collectively are designed so that Federal land management actions will achieve ACS objectives that strive to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and to restore currently degraded habitats.

The Basinwide Recovery Strategy also outlines a large number of non-Federal habitat programs. Because non-Federal habitat is managed predominantly for private rather than public purposes, expectations for non-Federal habitat are harder to assess. Degradation of habitat for ESA-listed fish from activities on non-Federal lands is likely to continue to some degree, although at a reduced rate due to state, tribal, and local recovery plans. Because a substantial portion of land in the ESA-listed salmonid ESUs is in state or private ownership, conservation measures on these lands will be key to protecting and recovering ESA-listed salmon and steelhead populations. NOAA Fisheries recognizes that strong conservation benefits will accrue from specific

components of many non-Federal conservation efforts, however, some of those conservation efforts are very recent and few address salmon conservation at a scale that is adequate to protect and conserve entire ESUs. NOAA Fisheries will continue to encourage non-Federal landowners to assess the impacts of their actions on ESA-listed salmonids. In particular, NOAA Fisheries will encourage state and local governments to use their existing authorities and programs, and will encourage the formation of watershed partnerships to promote conservation in accordance with ecosystem principles.

#### 4.2.3 *Hatchery Effects on the Baseline*

For more than 100 years, hatcheries in the Pacific Northwest have been used to replace natural production lost as a result of the construction of hydropower dams, other development, and to enhance fisheries, not to protect and rebuild naturally-produced salmonid populations. As a result, most salmonid populations in the region are primarily hatchery fish. In 1987, for example, 95 percent of the coho salmon, 70 percent of the spring chinook salmon, 80 percent of the summer chinook salmon, 50 percent of the fall chinook salmon, and 70 percent of the steelhead returning to the Columbia River basin originated in hatcheries (CBFWA 1990). While hatcheries certainly have contributed greatly to the overall numbers of salmonids, only recently has the effect of hatcheries on native wild populations been demonstrated. In many cases, these effects have been substantial. For example, the production of hatchery fish, among other factors, has contributed to the 90 percent reduction in wild coho salmon runs in the lower Columbia River over the past 30 years (Flagg *et al.* 1995).

NOAA Fisheries has identified four primary categories of risk that hatcheries can pose on wild-run salmon and steelhead: (1) ecological effects, (2) genetic effects, (3) overharvest effects, and (4) masking effects (NMFS 2000a). Ecologically, hatchery fish can increase predation on, displace, and/or compete with wild fish. These effects are likely to occur when fish are released in poor condition and do not migrate to marine waters, but rather remain in the streams for extended rearing periods during which they may prey on or compete with wild fish. Hatchery fish also may transmit hatchery-borne diseases, and hatcheries themselves may release diseases into streams via water effluents. Genetically, hatchery fish can affect the genetic variability of native fish via interbreeding, either intentionally or accidentally. Interbreeding can also result from the introduction of stocks from other areas. Theoretically, interbred fish are less adapted to and productive within the unique local habitats where the original native stock evolved. Most these hatchery impacts can not be quantified, but collectively are believed to have been an important factor in the decline of individual populations of listed Snake Basin ESUs.

NOAA Fisheries determined that there is a need for immediate hatchery reform and conservation actions (Federal Caucus 2000). Federal agencies are working with the Northwest Power Planning Council (NWPPC) to accelerate funding and implementation of the reform measures from the hatchery biological opinions and related actions that should proceed over the next 1 to 3 years. Such reforms will be pursued in the context of the Hatchery and Genetic Management Plans (HGMP). The HGMP is a tool for defining goals and objectives of a particular hatchery,

and its relationship to prioritized basin objectives, including harvest opportunities and wild stock performance. Specifically, each HGMP should ensure that genetic broodstock selected is appropriate, that it minimizes the potential for adverse ecological effects on wild populations, and that it is integrated into basinwide strategies to meet broader objectives. Future management of hatcheries will also need to occur within the context of fully implemented adaptive-management programs that focus on watershed management, not just on the fish themselves” (NRC 1996).

#### *4.2.4 Harvest Effects on the Baseline*

Initially, the non-Indian fisheries targeted spring and summer chinook salmon, and these runs dominated the commercial harvest during the 1800s. Eventually the combined ocean and freshwater harvest rates for Columbia River spring and summer chinook salmon exceeded 80 percent and sometimes 90 percent of the run, contributing to the species’ decline (Ricker 1959). From 1938 to 1955, the average harvest rate dropped to about 60 percent of the total spring chinook salmon run and appeared to have a minimal effect on subsequent returns (NMFS 1991). Until the spring of 2000, when a relatively large run of hatchery spring chinook salmon returned and provided a small commercial Tribal fishery, the last commercial season for spring chinook salmon had occurred in 1977. The summer chinook salmon run could not sustain the average harvest rate of 88 percent that was applied between 1938 to 1944 and produced lower returns between 1942 and 1949 (NMFS 1991). From 1945 through 1949, the Columbia River harvest rate on summer chinook salmon was reduced to about 47 percent, and subsequently, the run size increased. The construction of Grand Coulee Dam in 1941, with the resulting inundation of summer chinook salmon spawning areas, was a primary factor influencing this species’ declining abundance. In the 1950s and 1960s, harvest rates further declined to about 20 percent (Raymond 1988). This species has not been the target of any commercial harvest since 1963.

Following the sharp declines in spring and summer chinook salmon in the late 1800s, fall chinook salmon became a more important component of the catch. Fall chinook salmon have provided the greatest contribution to Columbia River salmon catches in most years since 1890. The peak year of commercial sales was 1911, when 49.5 million pounds of fall chinook salmon were landed. Columbia River chinook salmon catches were generally stable from the beginning of commercial exploitation until the late 1940s, when landings declined by about two-thirds to a level that remained stable from the 1950s through the mid-1980s (ODFW and WDFW 1999). Since 1938, total salmonid landings have ranged from a high of about 2,112,500 fish in 1941 to a low of about 68,000 fish in 1995 (ODFW and WDFW 1999).

The construction of The Dalles Dam in 1957 had a major effect on Tribal fisheries. The Dalles Reservoir flooded Celilo Falls and inundated the site of a major Indian fishery that had existed for millennia. Commercial Indian landings at Celilo Falls from 1938 through 1956 ranged from 0.8 to 3.5 million pounds annually, based primarily on dip netting (ODFW and WDFW 1999). With the elimination of Celilo Falls, salmon harvest in the area declined dramatically. In 1957, in a joint action, the states of Oregon and Washington closed the Tribal fishery above Bonneville

Dam to commercial harvesters. Treaty Indian fisheries that continued during 1957 through 1968 were conducted under Tribal ordinances. In 1968, with the Supreme Court opinion on the appeal of the *Puyallup v. Washington* case, the states reopened the area to commercial fishing by treaty Indians (ODFW and WDFW 1999). For the next 6 years, until 1974, only a limited Tribal harvest occurred above Bonneville Dam.

#### *4.2.5 Effects of Natural Conditions on the Baseline*

Changes in the abundance of salmonid populations are substantially affected by changes in the freshwater and marine environments. Recent evidence suggests that marine survival of salmonids fluctuates in response to 20- to 30-year cycles of climatic conditions and ocean productivity (Hare *et al.* 1999). This phenomenon has been referred to as the Pacific Decadal Oscillation. For example, large-scale climatic regimes, such as El Niño, appear to affect changes in ocean productivity and influence local environmental rainfall patterns that can result in drought and fluctuating flows. During the first part of the 1990s much of the Pacific Coast was subject to a series of very dry years and very low stream flows. In more recent years, severe flooding has adversely affected some stocks. The Snake River ESUs are affected by this broad environmental cycle, thus the survival and recovery of these species will depend on their ability to persist through periods of low natural survival rates.

Studies begun in 1997 by the Oregon Cooperative Fish and Wildlife Research Unit, USGS, and CRITFC have shown that fish-eating birds that nest on man-made islands in the Columbia River estuary (Caspian terns, double-crested cormorants, and glaucous-winged gulls) are significant avian predators of juvenile salmonids. Researchers estimated that the single tern colony on Rice Island (16,000 birds in 1997) consumed 6 to 25 million outmigrating smolts during 1997 (Roby *et al.* 1998) and 7 to 15 million outmigrating smolts during 1998 (Collis *et al.* 1999). The observed levels of predation prompted the regional fish and wildlife managers to investigate the feasibility of management actions to reduce the impacts. Early management actions appear to have reduced predation rates; researchers estimate that terns consumed 7.3 million smolts during 1999 (Columbia Bird Research 2000), and all of the tern colony potentially destined for Rice Island in 2001 and 2002 has shifted downstream to East Sand Island. However, terns, cormorants, gulls and pelicans nesting and roosting on other artificial islands in the estuary and hydropower reservoirs continue to consume many millions of smolts each year.

#### *4.2.6 Effects of Scientific Research, Monitoring, and Enhancement on the Baseline*

Snake River salmon and steelhead, like other ESA-listed fish, are the subject of scientific research, monitoring, and enhancement activities. Most biological opinions that NOAA Fisheries issues recommend specific monitoring, evaluation, and research projects to gather information to aid in the survival of the ESA-listed fish. In addition, NOAA Fisheries has issued numerous research and/or enhancement permits authorizing takes of ESA-listed fish over the past eight years. Each authorization for take by itself would not lead to decline of the species. However the sum of the authorized takes indicate a high level of research effort in the action

area, and as anadromous fish stocks have continued to decline, the proportion of fish handled for research/monitoring purposes relative to the total number of fish has increased. The effect of these activities is difficult to assess, nevertheless, the potential benefits to ESA-listed salmon and steelhead from the scientific information is likely to be greater than the potential risk to the species due to those efforts. Potential benefits include enhancing the scientific knowledge base for the species, answering questions or contributing information toward resolving difficult resource management issues, and directly enhancing the survival of the species. The information gained during research and monitoring activities is essential to assist resource managers in making more informed decisions regarding recovery measures. Moreover, scientific research, monitoring, and enhancement efforts are not considered to be a factor for the decline of salmon and steelhead populations.

To reduce adverse effects from research and enhancement activities on the species, NOAA Fisheries imposes conditions in its permits so that Permit Holders are required to conduct their activities in such a way as to minimize adverse effects on the ESA-listed species, including keeping mortalities as low as possible. Also, researchers are encouraged to use non-listed fish species and/or ESA-listed hatchery fish, instead of ESA-listed, naturally-produced fish, for scientific research purposes when possible. In addition, researchers are required to share sample fish, as well as the results of the scientific research, with other researchers as a way to avoid duplicative efforts and to acquire as much information as possible from the ESA-listed fish sampled. NOAA Fisheries works with other agencies to coordinate research to prevent duplication of effort.

In general, for research and enhancement projects that require a section 10(a)(1)(A) permit, applicants will provide NOAA Fisheries with high take estimates to compensate for potential inseason changes to research protocols, accidental catastrophic events, and the annual variability in ESA-listed fish numbers. Also, most research projects depend on annual funding and the availability of other resources. So, a specific research project for which take of ESA-listed species is authorized by a permit may be suspended in a year when funding or resources are not available. Therefore, the actual take in a given year for most research and enhancement projects, as provided to NOAA Fisheries in post-season annual reports, is usually less than the authorized level of take in the permits and the related NOAA Fisheries consultation on the issuance of those permits. Therefore, because actual take levels tend to be lower than authorized takes, the severity of effects to the ESA-listed species are usually less than the effects analyzed in a typical consultation.

A substantial amount of the annual take of ESA-listed salmon and steelhead is related to assessing the impact of the hydropower dams on the mainstem Snake and Columbia Rivers. Scientific research, monitoring, and enhancement activities are required by the Reasonable and Prudent Alternative of the opinion on the FCRPS (NMFS 2000b). The Corps' Juvenile Fish Transportation Program results in a substantial amount of annual take of ESA-listed Snake River salmon and steelhead for enhancement purposes in the course of collecting salmon and steelhead smolts and transporting them around the hydropower dams and reservoirs. For a description of

the annual takes of ESA-listed Snake River salmon and steelhead associated with the hydropower dams on the mainstem Snake and Columbia Rivers, refer to the December 21, 2000 FCRPS biological opinion (NMFS 2000b), and the biological opinion on the issuance of an amendment of ESA Section 10(a)(1)(A) Permit 1237 for takes of six endangered or threatened species for the purpose of enhancement issued on April 26, 2001 (NMFS 2001).

## **5.0 Effects of the Action**

Federal agencies cannot undertake or authorize an action that is “likely to jeopardize the continued existence” of a species listed under the ESA. Joint NOAA Fisheries-USFWS regulations define “jeopardize the continued existence of” to mean “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers or distribution of that species” (50 CFR 402.02). In the context of jeopardy, “survival” is “the condition in which a species continues to exist into the future while retaining the potential for recovery” (USFWS/NMFS 1998).

NOAA Fisheries’ approach to determining whether a proposed action is likely to jeopardize the continued existence of listed salmon and steelhead is based on the concept of Viable Salmonid Populations (VSP) published by NOAA Fisheries in 2000 (McElhany *et al.* 2000). Four parameters form the key to evaluating the status of salmonid populations using the VSP approach. They are abundance, population growth rate, population spatial structure and diversity. NOAA Fisheries focuses on these parameters for several reasons. First, they are reasonable predictors of extinction risks (viability). Second, they reflect general processes that are important to populations of all species. For example, many factors influence abundance including habitat quality, interactions with other species, harvest programs and the artificial propagation programs. Many of these factors are species or ESU-specific. By focusing on abundance, general conclusions about an ESU’s extinction risk may be drawn, even in the absence of detailed, species-specific information on all the factors that influence abundance. Third, the parameters are measurable. The VSP document provides guidelines for each parameter and discusses specific methods for measuring population status in the context of each parameter.

The reason that factors such as habitat quality or species interactions are not part of the viability criteria is that the effects of these factors are ultimately reflected in the four primary parameters that are considered. For example, a population’s abundance and spatial structure are, to a large degree, determined by the quality and quantity of available habitat. The primary VSP factors affected by harvest actions considered in this Opinion will be abundance and growth rate and are the primary focus of the analysis that follows.

## **5.1 Incidental Take**

Take associated with the proposed recreational fisheries occurs primarily as incidental take associated with fisheries that target unlisted species and stocks. Other types of take include harassment by anglers and illegal harvest. All of the proposed fisheries in the Snake River basin that target anadromous fish are selective, in that only unlisted, hatchery-produced fish marked by a clipped adipose fin are legal to harvest. The adipose fin is excised from juvenile anadromous fish while they are rearing, prior to release from fish hatcheries. The healed scar and the missing fins are easily identified by anglers and fish with intact adipose fins are required to be released without removing them from the water. Other fisheries may be species-selective. For example, fall chinook may not be retained during the steelhead season and juvenile steelhead or rainbow trout may not be retained in waters only open to the harvest of brook trout or mountain whitefish.

## **5.2 Snake River Sockeye Salmon**

The proposed action of modifying the permit is not expected to have effects beyond those of the existing permit on Snake River sockeye salmon. Sockeye adults typically return to the Snake River basin from July through September, primarily in July and August. The proposed chinook salmon fisheries in the lower mainstem Snake River and Salmon River are the only fisheries contained in this modification that would occur in areas used by sockeye salmon. However, the Snake River fishery will close by the end of May and Salmon River fishery by mid June, prior to the time sockeye salmon adults would be expected to pass through these areas.

## **5.3 Snake River Fall Chinook Salmon**

The proposed action of modifying the permit is not expected to have effects beyond those of the existing permit on Snake River fall chinook salmon. The proposed spring/summer chinook salmon recreational fisheries end no later than August 7, prior to the expected arrival of listed Snake River fall chinook salmon.

## **5.4 Snake River Steelhead**

The proposed modification of permit 1233 may have additional effects beyond those of the existing permit on Snake River Basin steelhead. The proposed spring/summer chinook salmon recreational fisheries start in mid-to-late April when listed steelhead are expected to have passed through the areas open to salmon fishing and end no later than August 7, prior to the expected arrival of the fall run of listed Snake River Basin steelhead. Some listed steelhead kelts (fish that have spawned) may occur in the areas open to salmon fishing early in the salmon season. Until April 30, unlisted, hatchery-produced steelhead kelts may be retained in possession by anglers who have the proper license and catch card. Unmarked, naturally produced kelts must be released. Very few steelhead kelts survive to repeat spawning in the Snake River basin and the biological impact of handling kelts in a salmon fishery is not measurable. Some steelhead may arrive on the fall migration before the salmon season closes. For the past ten years, 1.7% of the annual adult steelhead return has crossed Lower Granite Dam by August 1 (FPC 2001), and it is possible that some of the early migrants could arrive in waters open to salmon fishing prior to the salmon season closing (August 7). However, the fishery areas most likely to encounter an adult

steelhead (lower main stem Snake River and Salmon River) are closed to chinook salmon fishing by the end of May and middle of June, respectively. Allowing salmon fishing in the Lower Salmon River, the Hells Canyon reach of the Snake River, and the Idaho-Washington boundary water reach of the Snake River may slightly increase the possibility that a salmon angler will encounter a steelhead. However, NOAA Fisheries assessed the catch and release steelhead fishery which begins August 1 in the original biological opinion associated with permit 1233, and the proposed modification is not expected to increase the impact beyond that previously evaluated.

No incidental catch or harvest of listed steelhead has been reported in the annual reports of recreational spring chinook salmon fishing in recent years.

The effects of steelhead take during general fishing seasons incidental to fishing for resident species was analyzed in the biological opinion on the original issuance of permit 1233 (NMFS 2000a). The accidental or incidental capture on an adult steelhead by an angler who is seeking resident species such as trout and bass is an unusual, but not impossible, occurrence. To address possible incidental take of adult, threatened, Snake River basin steelhead, NOAA Fisheries proposes to authorize take of up to 10 listed adult steelhead, of which one might die due to hooking injuries incidental to the conduct of resident species fisheries managed by the IDFG under General Fishing Regulations.

#### *Catch and Release Mortality*

##### *Adult steelhead*

Idaho implemented catch and release fishing for adult wild steelhead beginning in the mid 1980s, which significantly reduced fishing related mortality. The available information assessing hook and release mortality of adult steelhead suggests that hook and release mortality is low. Hooton (1987) found catch and release mortality of adult winter steelhead to average 3.4% (127 mortalities of 3,715 steelhead caught) when using barbed and barbless hooks, bait and artificial lures. Among 336 steelhead captured on various combinations of popular terminal gear in the Keogh River, the mortality of the combined sample was 5.1%. Natural bait had slightly higher mortality (5.6%) than did artificial lures (3.8%), and barbed hooks (7.3%) had higher mortality than barbless hooks (2.9%). Hooton (1987) concluded that catch and release of adult steelhead was an effective mechanism for maintaining angling opportunity without negatively impacting stock recruitment. Reingold (1975) showed that adult steelhead hooked, played to exhaustion, and then released returned to their target spawning stream as well as steelhead not hooked, and played to exhaustion. Pettit (1977) found that egg viability of hatchery steelhead was not negatively affected by catch-and-release of pre-spawning adult female steelhead. Bruesewitz (1995) found, on average, fewer than 13% of harvested summer and winter steelhead in Washington streams were hooked in critical areas (tongue, esophagus, gills, eye). The highest percentage (17.8%) of critical area hookings occurred when using bait and treble hooks in winter steelhead fisheries.

The referenced studies were conducted when water temperatures were relatively cool, and primarily involve winter-run steelhead. Data on summer-run steelhead and warmer water conditions are less abundant (Cramer and Associates 1997). Catch and release mortality of steelhead is likely to be higher if the fishery occurs during warm water conditions. In a study conducted on the catch and release mortality of steelhead in a California river, Taylor and Barnhart (1999) reported over 80% of the observed mortalities occurred at stream temperatures greater than 21 °C. Catch and release mortality during periods of elevated water temperature are likely to result in post-release mortality rates greater than reported by Hooton (1987) because of warmer water and extended freshwater residence of summer fish which make them more likely to be caught. Although Snake River steelhead are summer-run fish which enter the Columbia River in July, August and September, the fisheries in the Snake River take place from September through April in cooling or cold (0 to 15° C) water. As a result, NOAA Fisheries expects hook and release mortality to be in the lower range discussed above.

To evaluate the population effects of catch-and-release fishing on listed steelhead, it is necessary to calculate what proportion might be subject to encounters with anglers. IDFG biologists have generated annual estimates of the harvest rate of Idaho origin hatchery steelhead by recreational anglers licensed in Idaho. The number of fish destined for Idaho waters is calculated by adjusting the count of hatchery steelhead over Lower Granite Dam by the number of hatchery steelhead originating from hatcheries above Lower Granite Dam in Oregon and Washington. By dividing the adjusted count of hatchery steelhead over Lower Granite Dam into the IDFG Phone Survey estimate of harvest, biologists are able to compute a harvest rate for hatchery stocks. This method provides the best available estimate of the maximum encounter rate for listed stocks (IDFG 2002b).

To generate an estimate of the harvest rate of hatchery steelhead returning to Idaho by anglers licensed to fish in Idaho, the estimated number of hatchery steelhead crossing Lower Granite Dam that are returning to Oregon and Washington hatchery facilities in the Grande Ronde and Imnaha Rivers, including the harvest of these fish in Idaho, is subtracted from the total count of hatchery steelhead crossing Lower Granite Dam. Complete data are available for the annual returns of steelhead to Oregon and Washington hatcheries situated on tributaries of the Snake River above Lower Granite Dam for the years 1990 through 1996. Additional information is available for 1997 through 2001. The percent of the Lower Granite Dam Count of hatchery steelhead bound for Idaho ranged from 83.6 in 1996 to 91.5 in 1990 and averaged 87.4 (Table 2).

The estimated harvest rate of Idaho origin hatchery steelhead by recreational anglers licensed to fish in Idaho ranged from 0.35 in 1995 to 0.60 in 1993 and averaged 0.47 (Table 3). The estimated proportion of hatchery fish caught, that are kept by Idaho anglers averages 0.723. The estimated encounter rate of hatchery steelhead is the harvest rate (0.47) divided by the proportion caught that are kept (0.723) or 0.65.

If the encounter rate of hatchery steelhead is the same as the encounter rate of listed steelhead then 0.65 of the listed steelhead that enter Idaho are caught and released. If 5% of the listed

steelhead that are incidentally caught and released subsequently die, then 3.25 percent of the wild steelhead entering Idaho each year are incidentally killed during the conduct of the recreational fishery that targets unlisted hatchery stocks.

Illegal harvest in recreational fisheries has not been identified as a significant cause of the decline of listed species (62 FR 43937, August 18, 1997). IDFG law enforcement officers patrol all open fishing waters and utilize check stations and undercover patrols in areas of high activity. Although illegal harvest does occur, and incidents of intentional or inadvertent illegal take of listed species are cited every year, the number of fish detected as illegal harvest is very small, and is not expected to negatively impact the listed populations.

Table 2. The estimated number of Idaho origin hatchery steelhead entering Idaho for the years 1990 to 2001. (From IDFG 2002a)

Year	Hatchery Run Over Lower Granite Dam	Oregon Wallowa Run	Oregon Imnaha River	Washington Cottonwood Creek	Idaho Harvest of OR/WA Snake Stocks	Total Idaho Hatchery Return	% of Lower Granite Dam Counts bound for Idaho
1990	47,579	1,400	629	1,873	136	43,541	91.5
1991	81,731	6,937	1,428	1,777	395	71,194	87.1
1992	108,919	5,830	2,427	3,882	346	96,434	88.5
1993	52,414	3,953	173	2,188	288	45,812	87.4
1994	39,786	2,232	320	2,945	17	34,272	86.1
1995	71,135	3,976	626	4,087	259	62,187	87.4
1996	79,275	7,831	1,852	3,012	297	66,283	83.6
1997	77,879	NA	NA	NA	NA	* 68,066	* 87.4
1998	66,335	NA	NA	NA	NA	* 53,607	* 87.4
1999	62,846	NA	NA	NA	NA	* 54,927	* 87.4
2000	95,183	NA	NA	NA	NA	* 83,190	* 87.4
2001	220,303	NA	NA	NA	NA	* 192,545	* 87.4

\* Estimated based on the 1990 through 1996 average.

Table 3. The estimated harvest rate by recreational anglers licensed in Idaho on Idaho hatchery stocks for the years 1990 –2001 (from IDFG 2002)

Year	Total Return To Idaho Hatcheries	Estimated Harvest (based on phone survey)	Idaho Harvest of OR/WA Hatchery Stocks	Harvest of Idaho Hatchery Stocks	Harvest Rate on Idaho Hatchery Stocks
1990	43,541	19,190	136	19,054	0.44
1991	71,194	28,572	395	28,177	0.40
1992	96,434	44,662	346	44,316	0.46
1993	45,812	27,704	288	27,416	0.60
1994	34,272	19,618	17	19,601	0.57
1995	62,187	22,105	259	21,846	0.35
1996	66,283	27,211	297	26,914	0.41
1997	68,066	35,935	NA	NA	0.53
1998	53,607	22,166	NA	NA	0.41
1999	54,927	28,218	NA	NA	0.51
2000	83,190	35,941	NA	NA	0.43
2001	192,545	103,286	NA	NA	0.54
Average					0.47

The IDFG believes the estimated incidental mortality of 3.25% to be biased high and therefore a maximum. Of 4,500 miles of river and stream occupied by listed steelhead, 683 miles (approximately 15%) are open to harvest of steelhead. The open waters are located in the main stems of the largest rivers and downstream from fish hatcheries where unlisted, hatchery produced fish are known to return. The most important spawning streams for listed, naturally reproducing steelhead are closed to harvest and managed as refugia for listed fish. No fishing is allowed in the Middle Fork or South Fork of the Salmon River, or in the Salmon River tributaries that have been identified as important production areas. Only limited catch-and-release fishing is allowed in the Lochsa and Selway Rivers.

Although naturally produced, listed steelhead are mixed with unlisted hatchery fish when migrating through the open fishing areas, they are protected from anglers when they arrive in the

spawning streams. Anglers tend to concentrate in areas where high catch rates can be experienced. The most heavily fished areas for steelhead are the 40 miles of the Clearwater River immediately below Dworshak Hatchery, the 25 miles of the Little Salmon River which is the site of large hatchery releases and the sections of the main Salmon River near the Little Salmon, near Pahsimeroi Hatchery and downstream from Sawtooth hatchery. Particularly during the late winter and early spring period when intense fishing and harvest may occur on the hatchery returnees in these terminal areas, anglers are concentrated in a relatively small area and the proportion of listed fish in the catch is low. NOAA Fisheries agrees that limiting fisheries to times and areas where unlisted hatchery are most common and providing sanctuary areas that are closed to fishing where wild fish predominate serves to further reduce the encounter rate of listed fish in the fisheries.

NOAA Fisheries agrees that the estimate of 3.25% catch-and-release mortality is likely higher than the actual rate because of the factors discussed above. However, until the IDFG refines the creel census process to better define this estimate, this rate will be used to estimate recreational fishery impacts.

#### *Juvenile steelhead*

Juvenile steelhead occupy many waters that are also occupied by resident trout species and it is not possible to visually separate juvenile steelhead from similarly-sized, stream-resident, rainbow trout. Because juvenile steelhead and stream-resident rainbow trout are the same species, are similar in size, and have the same food habits and habitat preferences, it is reasonable to assume that catch-and-release mortality studies on stream-resident trout are similar for juvenile steelhead. Where angling for trout is permitted, catch-and-release fishing with prohibition of use of natural or synthetic bait will reduce juvenile steelhead mortality more than any other angling regulatory change. Many studies have shown trout mortality to be higher when using bait than when angling with artificially lures and/or flies (Taylor and White 1992; Schill and Scarpella 1995; Mongillo 1984; Wydoski 1977; Schisler and Bergersen 1996). Wydoski (1977) showed the average mortality of trout when using bait to be more than four times greater than the mortality associated with using artificial lures and flies. Taylor and White (1992) showed average mortality of trout to be 31.4% when using bait versus 4.9% and 3.8% for lures and flies, respectively. Schisler and Bergersen (1996) reported average mortality of trout caught on passively fished bait to be higher (32%) than mortality from actively fished bait (21%). Mortality of fish caught on artificial flies was only 3.9%.

In some fisheries that occur during the general trout season, larger hooks may reduce the efficiency of hooking juvenile steelhead because it will be more difficult for juveniles to swallow the bait (Muoneke and Childress 1994). Most studies have found little difference (or inconclusive results) in the mortality of juvenile steelhead associated with using barbed versus barbless hooks, single versus treble hooks, and different hook sizes (Schill and Scarpella 1997; Taylor and White 1992; Mongillo 1984). However, some investigators believe that the use of barbless hooks reduces handling time, and stress on hooked fish and adds to survival after release (Wydoski 1977). In summary, catch-and-release mortality of juvenile steelhead is expected to be

less than 10% and approaches 0% when fishermen are restricted to use of artificial flies and lures. Juvenile sockeye and juvenile chinook salmon are rarely encountered in trout fisheries, but it is expected that similar catch-and-release mortalities would occur on the small number of salmon encountered.

Although most rivers and streams that are occupied by juvenile steelhead in Idaho are open to trout fishing, angling regulations for trout are progressively more restrictive in more important production areas. River areas that are rarely occupied by juvenile steelhead are open under general fishing regulations, accessible production and rearing areas are covered by “Wild Trout” regulations with a 2-fish limit and the most important natural production areas are restricted to catch-and-release fishing with artificial flies and lures with single, barbless hooks only. Many of the important steelhead production areas are streams within Federally designated Wilderness, where access is limited and fishing pressure is light. The encounter rates are expected to be less than 10% and the mortality rates are expected to be very low, with an overall population impact in the range of 0.1 to 0.2%.

#### *Harassment*

Take by harassment could occur due to angling activities. The opinion on the original issuance of Permit 1233 discusses the impacts of wading and powerboat use on anadromous fish (NMFS 2000a). The sections of river that would be opened under the proposed modification are open to angling for other species under the current permit and are popular for recreational whitewater boating and fishing for resident species. The increases in harassment due to anglers that might result from the proposed modification are small and localized and not likely to increase take of listed species.

### **5.5 Snake River Spring/Summer Chinook Salmon**

#### *Catch and Release Mortality*

There are only a few reports which provide empirical evidence showing what the catch and release mortality is for chinook salmon in freshwater recreational fisheries. Oregon Department of Fish and Wildlife estimates a per-capture hook-and-release mortality for wild spring chinook in Willamette River fisheries of 8.6% (Schroeder *et al.* 2000), which is similar to a mortality of 7.6% reported by Bendock and Alexandersdottir (1993) in the Kenai River, Alaska. Based on the available data, the *U.S. v. Oregon* Technical Advisory Committee has adopted a higher 10 percent rate in order to make conservative estimates of incidental mortality in fisheries (R. Bayley, NOAA Fisheries, pers. comm.). For similar reasons, NOAA Fisheries also applies the 10 percent rate to provide conservative estimates of the hook and release mortality when evaluating the impact of proposed recreational fisheries. The number of listed fish that are hooked is reduced by adopting open season dates that avoid the timing of listed runs and by not allowing fishing in areas where listed fish are expected to predominate.

#### *Adaptive Management - Sliding Scale*

The proposed action of modifying permit number 1233 is intended to establish a process whereby NOAA Fisheries annually reviews data and predictions of the number and composition of returning Snake River spring/summer chinook salmon runs, population status and trends of listed and unlisted salmon populations prior to authorizing the state-operated recreational fisheries in the Snake River basin. The proposed permit modification is intended to provide for sensitive, responsive, scientifically founded fishery management which will control the effects on listed salmon populations within conservative limits while allowing harvest of unlisted species.

The variable survival from juvenile to adult and migratory nature of salmon populations make annual predictions of run size, and composition uncertain. In up-river areas such as the Snake River basin, the additional variables of migration timing and survival during upstream passage add uncertainty to annual pre-season predictions of run abundance. Fishery managers are unable to precisely predict the numbers, composition or arrival time of returning fish until they actually enter the Snake River. It is impossible to estimate the interception rates of fish passing through the recreational fishery until the fishery is actually being conducted. Quite often the actual returns to the Idaho portion of the Snake River basin vary by plus or minus 50% from preseason predictions, and weekly run updates may vary more than 10%. For fishing regulations to be adequately protective, yet flexible enough to quickly adapt to changes in run timing and composition, it is often necessary to adjust seasons, regulations and take limits immediately before or during the fishing season. The past practice of setting seasons and providing annual permit modifications based on pre-season predictions has failed to be flexible and cannot be completed in a timely manner. Therefore, the proposed modification sets conservative sideboards within which in-season adjustments may be made, based on analysis of the most current data.

The following analysis uses the analysis of the 2002 Snake River spring/summer chinook fishery, using the proposed sliding scale of allowable incidental impacts based on run size which would be then used in the remaining years of permit 1233 ( section 5.6).

Fishing regulations for adult chinook salmon in the Idaho fisheries have generally been conservative and designed to avoid interception of naturally produced fish. For example, only about 6% of the river miles occupied by salmon are proposed to be open to fishing, and the open areas are restricted to the times and places where hatchery-produced fish are expected to be most abundant. As described in section 5.1, above, harvest is restricted to hatchery-produced fish that are marked by an excised adipose fin and healed scar, and fishing tackle is restricted to barbless hooks to reduce injuries and facilitate release of listed fish that may be hooked. Fewer than 10% of the listed chinook are expected to be encountered in fisheries and population mortality, at a 10% per capture rate, is expected to be less than 1%. However, just as natural chinook populations vary, the incidental mortality associated with harvest of hatchery stocks should also be designed to be more restrictive at smaller run sizes and gradually increases as the run approaches or exceeds the interim recovery goal.

Snake River spring/summer chinook salmon require additional protections to ensure survival and recovery when the ESU declines to very low numbers. There is a need to develop a permit monitoring mechanism that can be responsive to highly variable population levels experienced in recent years for the Snake River spring/summer chinook salmon ESU while at the same time providing the necessary adaptive management flexibility for pre-season and in-season regulation adjustments to ensure that regulations are adequately protective. NOAA Fisheries proposes to use a sliding scale for incidental harvest mortality to provide the necessary analytical tool for the annual analysis NOAA Fisheries will conduct on the IDFG's spring chinook fishery proposal. The sliding scale would be based on the number of adult spring chinook projected to pass Lower Granite Dam as follows: 1) no incidental take will be allowed, except for limited terminal areas, when fewer than 2,800 natural fish cross Lower Granite Dam, 2) the total incidental mortality of listed Snake River spring summer chinook salmon in recreational fisheries shall be no more than 0.25 % of the total run when between 2,800 and 4,500 wild/natural fish pass lower Granite Dam, 2) the incidental mortality shall not exceed 0.5% of the number of fish between 4,500 and 10,000 and, 3) the incidental mortality shall not exceed 0.75% of the fish between 10 and 15,000, 4) the incidental take shall not exceed 1.0% when the total run is between 15,000 and 20,000, 5) the incidental take shall not exceed 1.5% between 20,000 and 25,000, and 6) the incidental mortality shall not exceed 2.0% when the total run is in excess of 25,000 (Table 4).

**Table 4. Proposed sliding scale for IDFG recreational fishing impacts on listed Snake River spring/summer chinook in the Snake River basin (excluding the South Fork Salmon River terminal fishery).**

<b>Lower Granite Dam Predicted Return of Naturally Produced Listed Spring Chinook</b>	<b>Proposed Maximum Percent of Naturally produced Run Mortality for IDFG Recreational Fishery</b>	<b>Range of Potential Incidental Mortalities (number of fish)</b>	<b>Estimated Total Take (catch and release)</b>
< 2,800 *	0%	0	-
2,800 to 4,500 *	0.25%	7 - 11	70-110
4,501 to 10,000	0.5%	22 - 50	220-500
10,001 to 15,000	0.75%	75 - 112	750-1,120
15,001 to 20,000	1.0%	150 - 200	1,500-2,000
20,001 to 25,000	1.5%	300 - 375	3,000-3,750
> 25,001	2.0%	> 500	>5000

\* At these low run sizes, fisheries should be restricted to terminal areas.

The harvest sliding scale would apply only to the early, spring component of the Snake River spring/summer chinook salmon ESU (Lower Granite Dam counts through June 18 of each year). NOAA Fisheries will also analyze the IDFG's annual proposed fishery to ensure that individual components of the ESU are not subject to a greater incidental harvest impact than the percentage specified in the sliding scale. As an example, a preseason forecast of 24,100 spring chinook salmon would allow an incidental mortality of 1.5%. In its annual review and analyses of the proposed fishery, NOAA Fisheries will assess whether incidental mortality to Salmon River natural adults would exceed 1.5%. This will ensure that individual components of the ESU are not subjected to substantially greater impact than the percentage specified in the sliding scale. Alternatively, NOAA Fisheries could also approve some fisheries at the lowest end of the sliding scale as long as impacts are limited to specific terminal areas. Examples of these types of fisheries occur in the Clearwater River (where no take would be expected), and Little Salmon/Rapid River (where the hatchery and natural populations appear to be genetically similar).

Application of the sliding scale could also affect which river sections may be open to fishing for chinook salmon in any year analyzed. In a year like 2002, with the preseason prediction of the second largest return of hatchery-produced salmon on record, and a preseason prediction of naturally-produced fish that is equal to approximately 93% ( $29,400/31,440 = .935$ ) of the delisting level for the Snake River spring/summer chinook salmon ESU identified in the 1995 proposed recovery plan (NMFS 1995), some additional river sections could be open to fishing. Alternatively, in a year when preseason predictions were in the range of one-half the 2002 prediction, mixed stock fisheries such as the lower main stem of the Snake River or the lower Salmon River may not be appropriate. In the case of a predicted return of fewer than 10,000 naturally-produced fish, incidental impacts to listed fish would be limited to 50 or fewer and it is likely that the open fisheries would be restricted to areas where few listed fish are expected to occur such as the Clearwater River, the Little Salmon River below Rapid River, and the Snake River reach immediately below Hells Canyon Dam. Also, in years of poor natural returns, hatchery returns are likely to be poor and the recreational fishing season length and bag limit are likely to be restricted compared to years with larger returns.

In development of the 2002 chinook fishery proposal, the IDFG used the TAC method of converting fish of Snake River origin at the mouth of the Columbia River upstream to Lower Granite Dam (IDFG 2002b). Based on past performance of the TAC estimate, the IDFG analyzed run sizes based on the TAC estimate  $\pm 50\%$ . This information is presented in Table 5 as a range of estimates for Snake River spring and summer chinook salmon returning to Lower Granite in 2002. The estimate of total adult returns ranges from approximately 46,700 to 140,100 adult chinook (IDFG 2002b), and is likely to be the second largest since counting began at the Snake River dams. The composition of the run is estimated to be approximately 70% hatchery fish and 30% wild and natural fish. The number of naturally produced spring/summer chinook salmon adults returning to Lower Granite is projected to range from approximately 14,550 to 43,650 in 2002 (Table 5).

Table 5. Forecast of spring and summer chinook salmon migrating over Lower Granite Dam in 2002 (IDFG 2002)

Run Type	Hatchery			Wild/Natural			Total Run		
	Low	Point	High	Low	Point	High	Low	Point	High
Spring Run	28,400	56,800	85,200	12,150	24,300	36,450	40,550	81,100	121,650
Summer Run	3,750	7,500	11,250	2,400	4,800	7,200	6,150	12,300	18,450
Total	32,150	64,300	96,450	14,550	29,100	43,650	46,700	93,400	140,100

The following analysis focuses on the 2002 run size predictions and the analysis of impacts this year as an example of the process that is used to evaluate fishery effects prior to annual approval of the activities covered by permit number 1233. The same process that applies to assessing the fishery impacts in 2002 will be used to assess fishery activities and take levels in future years. Fishery impact assessment relies on the projected number of naturally produced spring chinook salmon adults crossing Lower Granite Dam. For purposes of impact assessment, all of the naturally produced spring chinook projected to return to Lower Granite Dam will be considered part of the listed ESU, although this group does contain unlisted but naturally produced fish bound for the Clearwater drainage.

The following sections address the proposed expanded fishing areas for spring chinook salmon in sections of four rivers; Clearwater River, Little Salmon River, Lower Salmon River, and Snake River.

### 5.5.1 Clearwater River

Spring chinook in the Clearwater River are not considered part of the Snake River ESU and therefore they are not listed. The proposed harvest targets only adipose-clipped, hatchery-produced chinook salmon. Fisheries will be conducted similar to those of 1997, 1998, 2000, and 2001, which were previously assessed and found to have no effect on listed Snake River spring/summer chinook salmon (NMFS 2000a). The 2002 fishery will be conducted within a time and location framework similar to the previously authorized fisheries with additional portions of the South Fork Clearwater River, and Lochsa River being opened to fishing. Monitoring of the previous fisheries has detected no take of listed spring/summer chinook salmon (IDFG 2001b). As a result, NOAA Fisheries concludes that the proposed addition of portions of the South Fork Clearwater River and Lochsa River to open areas for the fishery will have no effect on listed spring/summer chinook salmon.

### 5.5.2 Little Salmon River

NOAA Fisheries is proposing to modify permit 1233 to expand the open fishing area in the Little Salmon River from 4 miles to 25 miles of stream (mouth to Smokey Boulder Bridge). The fishery will target unlisted, marked, hatchery-produced adults that are surplus to hatchery broodstock needs, and impacts to listed spring/summer chinook salmon will result from incidental catch and release mortality.

The IDFG has estimated that a total of 10,100 unlisted, hatchery-produced, adults will enter the Little Salmon River in 2002. A total of 582 (range 291-873) naturally produced spring/summer chinook adults are projected to return to the Little Salmon River drainage in 2002 (IDFG 2002b).

NOAA Fisheries has evaluated mortality estimates for two fisheries that target the unlisted fish returning to Rapid River Hatchery. The IDFG proposes to conduct a fishery in the lower Salmon River from Hammer Creek to the Little Salmon river and in the Little Salmon River from its mouth upstream approximately 25 miles to the Smokey-Boulder bridge. The IDFG estimates that there will be 10,100 salmon returning to Rapid River hatchery. The hatchery requires 2,400 fish for broodstock, leaving an estimated harvestable component of 7,700 fish which is divided evenly between the State, and the Nez Perce Tribe (3,850 each). Based on the 2001 fishery in the lower Salmon River, the IDFG proposes to take 40% of the harvest in the Salmon River and 60% in the Little Salmon River. The overall state harvest share is 3,850 fish or 38% of the total return ( $3,850 / 10,100 = .38$ ). If 40% of the catch occurs in the Salmon River, then the harvest rate in the Salmon River would be 0.15 ( $1,540 / 10,100 = 0.15$ ), and the remaining harvest taken in the Little Salmon River would be 0.23 ( $2,310 / 10,100 = 0.23$ ).

To estimate the take of listed fish, NOAA Fisheries assumes that the listed and unlisted stocks bound for the Little Salmon and Rapid Rivers are mixed in proportion to their overall abundance and listed and unlisted fish are equally susceptible to being caught in the fishery. To estimate the encounter rate on listed fish, the target harvest rate on listed fish is increased to account for the fact that some harvestable fish are caught and released. The IDFG reports that, on average, 82% of the unlisted fish caught are harvested and 18% are released. If 0.82 of fish caught are retained and 0.23 of the total run are harvested, the handling rate on the total run is  $0.23 / 0.82$ , or 0.28.

Using this information, NOAA Fisheries estimates a mortality of 16 (range 8 to 24) naturally produced, listed Snake River adult spring/summer chinook salmon will result from the catch and release of 81 to 244 listed adults incidentally caught in the Little Salmon River recreational fishery (IDFG 2002b).

The maximum mortality estimate of 24 naturally produced, listed Snake River spring/summer chinook salmon adults represents 0.16% of the “low estimate” of the number of naturally produced spring and summer chinook adults projected to cross Lower Granite Dam of 14,550 (Table 5). This level of mortality also represents 2.7% of the number of naturally produced adults projected to return to the Little Salmon River in 2001. The potential loss of 2.7% of adult

chinook as they arrive in the spawning tributaries may affect the Rapid River naturally-produced chinook salmon population. However, this population is heavily hatchery-influenced and appears to have a stable population trend. The proposed level of harvest is not expected to markedly affect this trend, and will not have a large effect on survival and recovery of the Snake River spring/summer chinook ESU.

In the remainder of the Little Salmon river drainage, excluding Rapid River, natural production potential is limited. The mainstem is steep and cascading and has been highly modified by construction and maintenance of U.S. Highway 95, which forms one bank of the river for most of its length. There is very little spawning gravel, and pool habitats are limited. Some suitable spawning and rearing habitat is available in Hazard, Hard and Boulder Creeks. Over the past 35 years, several hundred thousand Rapid River Hatchery smolts have been released at the mouth of Hazard Creek, and thousands of returning adult salmon have been redistributed from Rapid River Hatchery to Hazard Creek, and its vicinity for fishery augmentation and natural spawning.

At the inception of the Rapid River Hatchery program, there was a small group of relatively later-timed fish that returned to the hatchery weir each year. These were presumed to be the progeny of natural production in the system, and representative of an indigenous wild population of Snake River spring/summer chinook salmon. Hatchery personnel allowed chinook to pass the hatchery weir based on time of arrival at the weir, and visual identification of the "bright" fish. Fisheries were managed to minimize impacts on this later-timed component. For the first 25 years of Rapid River hatchery operation (roughly 1967 to 1992), hatchery fish were not differentially marked and there were relatively few tags on either hatchery or naturally produced fish, so the separation of fish at the weir into hatchery and natural components depended on timing, visual characteristics and the judgement of hatchery personnel.

Recent information suggests that this group of later-timed, unmarked fish that return to the Rapid river weir are not genetically distinct from the hatchery fish (P. Moran, NOAA Fisheries, pers. comm.). Comparison of arrival timing at the Rapid River weir of marked and unmarked adult chinook since the mid-1990s shows that there is no differentiation in timing.

The fishery may open as early as April 15, with a closing date of August 7, or earlier if harvest objectives have been achieved or authorized take has been reached. The "early" opening date is intended to help facilitate harvest of the available hatchery adults, and provide maximum opportunity for recreational anglers if the run is early. The August 7 closing date is chosen to include the first full weekend in August, yet close before listed Snake River fall chinook or steelhead are likely to be present in the fishing area. In-season monitoring will lead to closure of the fishing if take quotas or harvest shares are reached prior to the calendar date.

### 5.5.3 Lower Salmon River

NOAA Fisheries is proposing to modify permit 1233 to include the Lower Salmon River from Hammer Creek upstream to the mouth of the Little Salmon River in waters open to anadromous salmon fishing. In the analysis that follows, NOAA Fisheries used a calculation relative to handling rates and incidental mortality similar to that used to estimate incidental take of listed species in the Little Salmon River. The IDFG estimates that 89% of the unlisted fish caught in the lower Salmon River were retained in a similar fishery in 2001.

There are likely to be several listed stocks of Snake River spring/summer chinook passing through the fishing area during the open fishing season. The specific area proposal for a lower Salmon River fishery is from Hammer Creek upstream to the Little Salmon River, a distance of 35 miles. The proposed fishery period is April 15 through June 16, with the earlier closing date chosen to limit overlap with listed summer chinook returning to the South Fork Salmon River. The fishery location and open season dates are selected to minimize interception of listed fish and reduce the risk of fishery impacts. Monitoring and evaluation is intended to check the validity of these assumptions and allow adaptive management of the fisheries. Because the fishery is scheduled to close June 16, most of the fish encountered are expected to be spring run and the listed summer-run chinook destined for the South Fork Salmon River, Pahsimeroi River and upper Salmon River should not be encountered. Listed stocks which could be exposed to mortality in the fishery would be primarily spring chinook destined for the Middle Fork Salmon River, Salmon River canyon tributaries, Lemhi River, East Fork Salmon River, Yankee Fork and portions of the upper Salmon River including Sawtooth Hatchery. Using pre-season run projections provided by TAC, the IDFG has estimated that 7,101 listed spring chinook, including the naturally-produced chinook returning to the Little Salmon River drainage, could pass through the Lower Salmon River during the dates of the proposed fishery.

The IDFG proposes to implement a fishery in the lower Salmon River targeting the unlisted chinook salmon returning to Rapid River Hatchery at a 0.15 harvest rate. If anglers follow the past pattern of retaining 0.89 of the legally harvestable fish, then the encounter rate on listed fish would be 17% ( $0.15 / 0.89 = 0.17$ ). At a 10% catch-and-release mortality rate it is estimated that the incidental mortality of listed fish would be 0.017 (1.7%), and 121 ( $0.017 \times 7,101$ ) listed fish would be expected to die incidental to the harvest of unlisted fish. However, NOAA Fisheries in their annual assessment of Salmon River fisheries will apply the incidental take percentage identified in the sliding scale to mainstem Salmon River fisheries. This is to assure that Salmon River natural populations are afforded the level of protection intended by the sliding scale. For 2002, this results in limits on the estimated incidental mortality in the Salmon River to 1.5%. This results in a maximum allowable incidental mortality in the lower Salmon River recreational fishery of 106 listed fish ( $0.015 \times 7,101 = 106$ ).

### *Fishery Monitoring and Enforcement*

Elements of the previously approved conservation plan as well as special conditions of Permit 1233 will be followed. The fishery will be monitored for legal and illegal harvest and incidental catch and release of both marked and unmarked chinook salmon. Standards will be sufficient to meet permit requirements and will be similar to monitoring for previous chinook salmon recreational fisheries. IDFG staff will utilize a combination of roving creel census, random creel census from enforcement checks, mandatory catch cards and check stations to provide the most effective monitoring of angler participation and harvest composition in the fishery. The arrival timing of PIT tagged natural adult chinook salmon at Lower Granite Dam prior to and during the fishery period will be tracked. This information will be provided to NOAA Fisheries as it becomes available, within the fishing season, to help cross-check IDFG assumptions regarding natural fish timing and interception.

#### **5.5.4 Snake River**

##### Upstream of the Imnaha River:

In 2002, an estimated 500 to 800 adult hatchery chinook salmon are expected return to the foot of Hells Canyon Dam (Snake River) where they are blocked from further migration and have no opportunity to spawn unless they are trapped for brood stock. These fish are the result of smolt releases made at the foot of the dam from Rapid River hatchery stock and are not listed. Access is limited in this river reach so the anticipated effort and harvest in this fishery will be lower than estimated in the other proposed spring chinook fisheries. The IDFG is proposing a recreational fishery that would be jointly managed by the Idaho Department of Fish and Game and the Oregon Department of Fish and Wildlife under the IDFG's permit 1233. The reach of the Snake River where the proposed fishery would be located forms the boundary between the two states. Reciprocal agreements between the states allow anglers from each state to fish the boundary waters.

The fishery boundaries are proposed to lie between a posted line at Dug Bar boat ramp, six miles upstream from the Imnaha River, and Hells Canyon Dam. A fishery between April 1 and August 7 is proposed based on arrival timing of spring chinook salmon at the trap with the ending date selected base on when fall chinook salmon would begin returning to the Snake River. The opportunity for chinook anglers to intercept listed, wild steelhead is minimal because wild steelhead in the 2001 run will have ascended tributaries prior to opening of the chinook fishery and the chinook fishery will close prior to arrival of steelhead in the 2002 run.

There is little natural production area in the Snake River upstream of the Imnaha River. Historically, the Hells Canyon reach of the Snake River has only produced fall chinook salmon; thus, very few, if any, naturally produced listed spring and summer chinook salmon are expected to be incidentally caught and released during the proposed fishery. The Smolt Density Model (StreamNet 2001) shows that this area of the Snake River comprises 0.04% of the spring and summer chinook production potential upstream of Lower Granite Dam. Only two small, steep, tributaries (Sheep Creek and Granite Creek) are judged to be potential production areas for spring

chinook. There is little evidence with current low run sizes that spring chinook salmon production is occurring in this area. As a result, any ESA-listed adult fish that are taken incidentally in this fishery will likely be strays from other areas of the Snake River basin.

Unmarked spring chinook are intercepted at the Hells Canyon Dam trap annually. The unmarked proportion trapped averaged 6.6% from 1997 through 2000 and ranged from 1.5% to 10.8%. However, there is high probability that most, if not all, of these fish are mis-clipped Rapid River Hatchery chinook salmon (see above discussion for Little Salmon River). Because smolts released into the Snake River at Hells Canyon Dam are reared at Rapid River Hatchery the same proportion of mis-marked hatchery fish is expected to return to Hells Canyon (IDFG 2001a).

Few naturally produced spring/summer chinook salmon are expected to be encountered during the fishery. It is likely that any unmarked fish is either a stray from some other area, an unmarked or mis-marked hatchery fish or the progeny of hatchery fish that have spawned naturally in the limited available area. The IDFG projects that the fishery would result in the incidental catch and release of no more than 10 listed adult spring chinook with mortality of 1 listed adult chinook salmon. NOAA Fisheries agrees that few listed fish are likely to occur in this river reach during the proposed fishery dates and concurs with the IDFG estimates.

#### *Fishery Monitoring and Enforcement*

Elements of the IDFG's existing conservation plan (IDFG 2000) as well as special conditions of Permit 1233 will be followed. IDFG staff is developing methods and logistics in concert with ODFW for effective monitoring of this fishery. This reach of the Snake River is located in Hells Canyon. Access is limited by rugged terrain, the remoteness of the area and restrictions of motor vehicles promulgated by Hells Canyon National Recreation Area. There are only three access points that may be reached by vehicles and much of the access to the canyon occurs by jet boats. The states plan to use a voluntary creel survey at key access points, random creel checks by the IDFG and Oregon State Police wildlife law enforcement officers patrolling the river reach by boat, saturation patrols at access points and catch-card reports to estimate harvest and participation in this fishery.

#### Snake River - Idaho/Washington Boundary water

The second proposed area for chinook salmon fishing in the Snake River is located where the Snake River forms a portion of the state boundary between Idaho and Washington. The proposed open area is from the Southway Bridge between Lewiston, Idaho and Clarkston, Washington upstream approximately 23 miles to the Heller Bar boat ramp (about 0.7 miles downstream from the mouth of the Grande Ronde River). Anglers from both states will fish the boundary waters under Idaho's permit 1233. This fishery is proposed to occur between mid-April and mid-May and also is designed to intercept some of the early-arriving hatchery-produced fish of Rapid River hatchery stock. The closing date is designed to limit exposure of listed fish destined for the Imnaha and Grand Ronde rivers to possible harvest or catch-and-release mortality.

This river reach has not been open to fishing for spring chinook salmon for at least 24 years, and there is little current information on which to base estimates of angler participation or success. However, there is information of run timing from PIT tag detections at lower Granite Dam which indicates that the unlisted, hatchery-produced, Rapid River component of the run can be expected to arrive in this river section earlier than the listed natural and hatchery-produced returns to other Snake River tributaries. The following analysis for 2002 is provided as an example of the analysis to be conducted during the remainder of the permit period.

### *Impacts*

The proposed fishery is designed to harvest 500 fish from the unlisted, hatchery-produced return to Rapid River Hatchery and Hells Canyon Dam, which is estimated at 10,600 fish. This represents a harvest rate of 0.047; however, if anglers retain 0.89 of the legal fish they catch, (the observed average in the lower Salmon River in 2001), the handling rate would be 0.053 ( $0.047 / 0.89 = 0.053$ ). The IDFG estimates that 10,763 listed fish could potentially pass through the fishery area during the spring of 2002. If the listed fish are equally susceptible to hooking and handling, then 570 would be caught and released ( $10,763 * 0.053 = 570$ ). If the 570 listed fish suffered a 10% catch-and-release mortality, then 57 listed fish could be expected to die, incidental to the harvest of 500 marked hatchery fish. However, if 10,763 listed fish were present in the fishery exactly at the same time as 10,600 unlisted fish, listed fish would outnumber the unlisted component and a direct-take situation would exist that cannot be authorized by a section 10(a)(1)(B) permit. The IDFG has presented data on PIT tags crossing Lower Granite Dam that indicates that unlisted hatchery-produced fish arrive in the fishery area well before the listed, natural fish. As a result, NOAA Fisheries proposes that this fishery close no later than the end of May to target the early returning hatchery fish and protect listed fish. During the season, the IDFG must maintain continual monitoring of the proportion of unlisted fish estimated at the dam and in the fishery. If at any time the PIT tag detections, fish counting observations or fishery monitoring indicates that the number of listed fish in the fishery area will equal or exceed the number of unlisted salmon, the IDFG must close the fishery.

### *Fishery Monitoring and Enforcement*

The IDFG and the WDFW will jointly conduct creel census and law enforcement activities. On Mondays, at the end of each four-day fishing period, harvest estimates will be tabulated, composition of the catch will be examined, any pertinent run count or timing data will be reviewed and a decision will be made as to whether the fishery will reopen on the following Thursday for another four-day (or possible shorter) fishing period. In addition to the catch quota of 500 marked hatchery fish, monitoring triggers that could stimulate adjustment or closure of the fishery include the proportion of natural fish caught and released, the number of PIT tag detections at Lower Granite Dam that are destined for the Imnaha River, Grande Ronde River or other listed programs and any other monitoring data that indicates fishery impacts are greater than anticipated.

## **5.6 Combined Impacts of Modification from Proposed Chinook Fisheries**

Based on the analysis of fisheries and predicted harvest rates, NOAA Fisheries estimates mortality of 180 listed, naturally produced Snake River spring chinook could result from catching and releasing 1,800 listed chinook salmon in the proposed fisheries (Table 6). This represents a mortality of 0.75% of the naturally produced component of the Snake River spring and summer chinook projected to cross Lower Granite Dam in 2002 (180 of the spring chinook minimum estimate of 24,124). These mortality levels are not expected to substantially effect the four VSP parameters (abundance, population growth rate, spatial structure, and diversity). The incidental take of 1,800 fish, and the mortality of 180, from a return estimated to be 24,124 will not substantially reduce the abundance of listed chinook in the Snake River basin in 2002. Similarly, population growth rate will not be measurably affected by the removal of 0.75 percent of the potential spawning population. Proposed fisheries occur primarily in lower mainstem areas and are not expected to differentially impact any single population. Natural populations will also be rapidly migrating through the proposed fishery areas and will have limited susceptibility to being caught. For these reasons, the incidental take will be distributed among a number of populations and is not likely to have any impact on the spatial distribution or genetic diversity of the return. The projected incidental mortality is also well within the numbers specified in the allowable mortality schedule (Table 4).

The IDFG has described an extensive monitoring plan for assessing the catch, effort and composition in the Snake River basin fishery in the conservation plan (IDFG 2000). Specific commitments described in this plan are incorporated into the evaluation of the fisheries assessed in this biological opinion. The IDFG will use information gathered through this fishery monitoring to modify or close fisheries as necessary to limit mortalities and other fishery impacts to the listed natural- and hatchery-produced chinook salmon that may be affected by the proposed fisheries consistent with the maximum harvest constraint determined in annual approvals.

Table 6. Estimated incidental catch-and-release and mortality of listed Snake River spring/summer chinook in recreational fisheries proposed by IDFG for 2002.

<b>River Section</b>	<b>Estimate of Listed Spring/summer Chinook Caught and Released</b>	<b>Estimated Incidental Mortality of listed Spring/Summer Chinook due to Fishing</b>
<b>Clearwater River sub-basin</b>	no listed spring/summer chinook salmon present	no incidental mortality
<b>Snake R. ID/WA boundary</b>	570	57
<b>Snake R. ID/OR boundary</b>	10	1
<b>Lower Salmon River</b>	1,060	106
<b>Little Salmon River</b>	160	16
<b>Total</b>	1,800	180

## 5.7 Effects of authorizing take of steelhead

The impact on listed steelhead of recreational fisheries targeting unlisted hatchery-produced spring/summer chinook salmon is likely to be small. Anadromous steelhead destined for the Snake River basin enter the Columbia River starting in late June, but very few fish arrive in the Snake River by the first of August. At the time that steelhead are entering the lower Snake River, spring/summer chinook salmon will have moved toward the headwater areas and salmon fishing effort will have followed the migrating salmon. However, it is possible that an early migrating steelhead could be caught by an angler seeking salmon before the salmon season closure on August 7. After entering the Idaho portion of the Snake River basin in the fall months, steelhead overwinter in the Snake River basin before spawning in headwater tributary streams the following spring. When the salmon season opens in April, fishing pressure is directed at the freshly arriving salmon in the lower portions of the drainage. In April and May, naturally spawning steelhead should be spawning in headwater tributaries far from the salmon fishing locations. However, it is possible that a salmon angler could hook a late migrating steelhead or a steelhead kelt (post-spawning fish that has survived the migration and spawning stress). Some waters are open to steelhead fishing until April 30, and fishing for steelhead is legal on a catch-and-release basis starting August 1, so there is some overlap between legal salmon and steelhead seasons. To date, the IDFG has detected no illegal harvest or incidental take of listed steelhead in anadromous salmon fishing seasons. The addition of approximately 130 miles of waters open to fishing for salmon in the Lochsa, South Fork Clearwater, Snake and Salmon rivers in the proposed modification will increase the likelihood of salmon anglers encountering listed

steelhead by some small amount. Until such take is detected, NOAA Fisheries assumes that it is small.

## **5.8 Effects on Critical Habitat**

The circumstances surrounding the designation of critical habitat for Snake River spring/summer chinook and fall chinook salmon and Snake River Basin steelhead (and the subsequent vacating of critical habitat designation for the latter) were described above. A description of the essential features of that habitat and a depiction of its present condition were also given. The discussion here addresses how those features of critical habitat for these ESUs are likely to be affected by the proposed actions.

Full descriptions of the proposed activities and the area in which those activities would occur are given above and in the original opinion. In general, the activities will be; 1) expanding the areas where spring chinook salmon recreational fishing may occur, 2) applying a sliding scale method of approval for incidental take of Snake River spring/summer chinook salmon, and 3) incidental take on Snake River steelhead now that take prohibitions have been promulgated. All of these actions are minimally intrusive in terms of their effect on habitat. Harvest activities do affect critical habitat in that harvest activities interfere with adult migratory passage through fish interception, but those impacts are accounted for explicitly in the above analysis. None of the other nine essential fish habitat feature listed earlier (i.e., stream substrates, water quality, water quantity, etc.) will be measurably affected.

## **6.0 Cumulative Effects**

Cumulative effects are those effects of future Tribal, state, local or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation. For the purpose of this analysis, the action area is that part of the Snake River basin described in the *Description of the Proposed Actions* section above. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities will be reviewed through separate section 7 consultation processes. Non-Federal actions that require authorization under section 10 of the ESA, and that are not included within the scope of this consultation, will be evaluated in separate section 7 consultations.

Future Tribal, state, and local government actions will likely be in the form of legislation, administrative rules, or policy initiatives. Government and private actions may include changes in land and water uses, including ownership and intensity, any of which could impact ESA-listed species or their habitat. Government actions are subject to political, legislative, and fiscal uncertainties. These realities, added to the geographic scope of the action area which encompasses numerous government entities exercising various authorities and the many private landholdings, make any analysis of cumulative effects difficult and frankly speculative. This section identifies representative actions that, based on currently available information, are

reasonably certain to occur. It also identifies some goals, objectives, and proposed plans by government entities, however, NOAA Fisheries is unable to determine at this point in time whether any proposals will in fact result in specific actions.

### State Actions

Each state in the Snake and Columbia River basins administers the allocation of water resources within its borders. Most streams in the basin are over appropriated even though water resource development has slowed in recent years. Washington closed the mainstem Columbia River to new water withdrawals, and is funding a program to lease or buy water rights. If carried out over the long term this might improve water quantity. The state governments are cooperating with each other and other governments to increase environmental protections, including better habitat restoration, hatchery, and harvest reforms. NOAA Fisheries also cooperates with the state water resource management agencies in assessing water resource needs in the Snake River basin, and in developing flow requirements that will benefit ESA-listed fish. During years of low water, however, there could be insufficient flow to meet the needs of the fish. These government efforts could be discontinued or even reduced, so their cumulative effects on ESA-listed fish is unpredictable.

The state of Washington has various strategies and programs designed to improve the habitat of ESA-listed species and assist in recovery planning, including the Salmon Recovery Planning Act, a framework for developing watershed restoration projects. The state is developing a water quality improvement scheme through the development of Total Maximum Daily Loads. As with the Oregon initiatives, these programs could benefit the ESA-listed species if implemented and sustained. The state of Idaho is involved with numerous efforts to enhance the survival and recovery of ESA-listed Snake River salmon and steelhead including an aggressive irrigation diversion screening program, conservation hatchery programs, habitat enhancement activities, and watershed planning efforts.

In the past, each state's economy was heavily dependent on natural resources, with intense resource extraction activity. Changes in the states' economies have occurred in the last decade and are likely to continue with less large scale resource extraction, more targeted extraction methods, and significant growth in other economic sectors. Growth in new businesses is creating urbanization pressures with increased demands for buildable land, electricity, water supplies, waste disposal sites, and other infrastructure. Economic diversification has contributed to population growth and movement in the states, a trend likely to continue for the next few decades. Such population trends will place greater demands in the action area for electricity, water, and buildable land; will affect water quality directly and indirectly; and will increase the need for transportation, communication, and other infrastructure development. The impacts associated with economic and population demands will affect habitat features, such as water quality and quantity, which are important to the survival and recovery of the ESA-listed species. The overall effect is likely to be negative, unless carefully planned for and mitigated.

Some of the state programs described above are designed to address these impacts. Also, Washington enacted a Growth Management Act to help communities plan for growth and address growth impacts on the natural environment. If the programs continue, they may help lessen some of the potential adverse effects identified above.

#### Local Actions

Local governments will be faced with similar but more direct pressures from population growth and movement. There will be demands for intensified development in rural areas as well as increased demands for water, municipal infrastructure, and other resources. The reaction of local governments to such pressures is difficult to assess at this time without certainty in policy and funding. In the past, local governments in the action area generally accommodated additional growth in ways that adversely affected ESA-listed fish habitat. Also, there is little consistency among local governments in dealing with land use and environmental issues so that any positive effects from local government actions on ESA-listed species and their habitat are likely to be scattered throughout the action area.

#### Tribal Actions

Tribal governments will continue to participate in cooperative efforts involving watershed and basin planning designed to improve fish habitat. The results from changes in Tribal forest and agriculture practices, in water resource allocations, and in changes to land uses are difficult to assess for the same reasons discussed under State and Local Actions. The earlier discussions related to growth impacts apply also to Tribal government actions. Tribal governments will need to apply comprehensive and beneficial natural resource programs to areas under their jurisdiction to produce measurable positive effects for ESA-listed species and their habitat.

#### Private Actions

The effects of private actions are the most uncertain. Private landowners may convert current use of their lands, or they may intensify or diminish current uses. Individual landowners may voluntarily initiate actions to improve environmental conditions, or they may abandon or resist any improvement efforts. Their actions may be compelled by new laws, or may result from growth and economic pressures. Changes in ownership patterns will have unknown impacts. Whether any of these private actions will occur is highly unpredictable, and the effects even more so.

#### Summary

Non-federal actions are likely to continue affecting the ESA-listed species. The cumulative effects in the action area are difficult to analyze considering the geographic landscape of this consultation, the political variation in the action area, the uncertainties associated with government and private actions, and the changing economies of the region. Whether these effects will increase or decrease is a matter of speculation; however, based on the trends identified in this section, the adverse cumulative effects are likely to increase. Although state, Tribal, and local governments have developed plans and initiatives to benefit ESA-listed fish,

they must be applied and sustained in a comprehensive way before NOAA Fisheries can consider them “reasonably certain to occur” in its analysis of cumulative effects.

## **7.0 Conclusions**

Based on the status, environmental baseline, and consideration of previous analysis; NOAA Fisheries concludes the following:

### *Snake River Sockeye Salmon*

NOAA Fisheries concludes that the proposed modification of permit 1233 will not jeopardize listed Snake River sockeye salmon nor result in the destruction or adverse modification of critical habitat.

### *Snake River Fall Chinook Salmon*

NOAA Fisheries concludes that the proposed modification of permit 1233 will not jeopardize listed Snake River fall chinook salmon nor result in the destruction or adverse modification of critical habitat.

### *Snake River Steelhead*

NOAA Fisheries concludes that the proposed modification of permit 1233 may affect, but will not jeopardize the continued existence of listed Snake River steelhead. NOAA Fisheries has determined that the incidental mortality rate of 3.2% of the adult, naturally-produced steelhead due to catch-and-release during fisheries that target unlisted, hatchery produced steelhead will not appreciably reduce the long-term survival and recovery of listed Snake River Basin steelhead in the wild.

### *Snake River Spring/Summer Chinook Salmon*

NOAA Fisheries concludes that the proposed modification of permit 1233 may affect but will not jeopardize the continued existence of listed Snake River spring/summer chinook salmon nor result in the destruction or adverse modification of critical habitat. NOAA Fisheries has determined that the level of incidental harvest-related mortality in the sliding scale summarized in Table 4 will not appreciably reduce the long-term survival and recovery of listed Snake River spring/summer chinook in the wild.

NOAA Fisheries’ conclusion is based on 1) the low incidental mortality of listed fish as a result of catch-and-release in the proposed fisheries, 2) the finding that the mortality of listed fish will not appreciably reduce the abundance, long-term population growth rate, spatial distribution, and genetic diversity of listed populations, 3) the large proportion of unlisted hatchery fish in the fishery areas, which will be selectively targeted by the fishery, and 4) coordination of the annual IDFG fishery proposals within a review that addresses the other state and Tribal fisheries within the Snake River basin that are proposed to occur each year. Annual approval by NOAA Fisheries of the recreational fisheries managed by the IDFG will assure that the long-term aggregate

impacts of recreational fisheries do not reduce the likelihood of survival and recovery of these populations.

## **8.0 Incidental Take Statement**

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibits the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the USFWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

### Reasonable and Prudent Measures

NOAA Fisheries believes that the reasonable and prudent measure(s) described in the original Incidental Take Statement are necessary and appropriate to minimizing take of Columbia River Basin salmonids listed or proposed for listing, and therefore remain valid for this modification. In addition, NOAA Fisheries will:

1. Assure that the proposed annual fisheries identified by IDFG are consistent with permit #1233 and incidental mortality specified in the sliding scale outlined in this Opinion.

### Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the action agency must comply with terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary with respect to species listed under the ESA.

The terms and conditions described in the original Incidental Take Statement remain valid for this modification. In addition:

- 1a. NOAA Fisheries shall require IDFG to submit their spring/summer chinook salmon fishery proposal by March 15 of each year a fishery is proposed.
- 1b. NOAA Fisheries shall review the annual spring/summer chinook salmon proposed fisheries identified by IDFG to determine if they are consistent with the permit and

sliding scale. If found to be consistent, NOAA Fisheries shall provide a letter to IDFG by April 15 approving the fishery in that year.

## **8.1 Amount or Extent of Take Anticipated**

### *Snake River Sockeye Salmon*

The incidental take statement for the original biological opinion for permit 1233 annually authorized no take of adult sockeye salmon, up to 34 residualized sockeye salmon from Redfish Lake, and up to 30 listed hatchery-produced juvenile sockeye salmon from Alturas, Redfish, and Pettit Lakes. The proposed modification of permit 1233 will result in no additional take.

### *Snake River Fall Chinook Salmon*

The incidental take statement in the original biological opinion for permit 1233 authorized annual take of 5 adult fall chinook salmon (1 mortality) under Idaho's general recreational fisheries and 20 adults (2 mortalities) resulting from Idaho's recreational steelhead fishery. The proposed modification of permit 1233 will result in no additional take.

### *Snake River Steelhead*

The incidental take statement in the original biological opinion for permit 1233 did not authorize take of Snake River steelhead as take prohibitions for Snake River steelhead had not been promulgated. Annual take resulting from modification of permit 1233 is authorized for steelhead directed recreational fisheries at up to 64 percent of the total return to Idaho for the catch and release of the naturally-produced adult steelhead with an associated incidental mortality of 3.2 percent. Annual take under Idaho's General Fishing Regulations (resident species fisheries) is authorized at up to 10 adults (1 associated mortality) and up to 10 percent (up to 0.2 percent associated mortality) for juvenile steelhead.

### *Snake River Spring/Summer Chinook*

The incidental take statement in the original biological opinion for permit 1233 authorized annual take of 500 juvenile spring/summer chinook (50 incidental mortalities associated with catch and release) and 56 adults (5 catch and release mortalities) resulting from Idaho's general recreational fisheries. An additional 10 adults and/or jack spring/summer chinook salmon were annually authorized due to unintentional harvest. Annual take of 80 adult spring/summer chinook (8 mortalities) was also authorized for spring chinook salmon fisheries on the Rapid River, Little Salmon River and Clearwater River. This take, in addition to that authorized for the South Fork Salmon River, remains in effect.

Additional annual incidental take of Snake River spring/summer chinook salmon as a result of modification of permit 1233 is authorized consistent with the following sliding scale of adults predicted to return above Lower Granite Dam:

**Authorized Take for IDFG recreational fishing impacts on listed Snake River spring/summer chinook in the Snake River basin.**

<b>Lower Granite Dam Predicted Return of Naturally Produced Listed Spring Chinook</b>	<b>Proposed Maximum Percent of Naturally produced Run Mortality for IDFG Recreational Fishery</b>	<b>Range of Potential Incidental Mortalities (number of fish)</b>	<b>Estimated Total Take (catch and release)</b>
< 2,800 *	0%	0	-
2,800 to 4,500 *	0.25%	7 - 11	70-110
4,501 to 10,000	0.5%	22 - 50	220-500
10,001 to 15,000	0.75%	75 - 112	750-1,120
15,001 to 20,000	1.0%	150 - 200	1,500-2,000
20,001 to 25,000	1.5%	300 - 375	3,000-3,750
> 25,001	2.0%	> 500	>5000

## **8.2 Effect of the Take**

In the original opinion that analyzed the issuance of permit 1233 on May 26, 2000, NOAA Fisheries determined that the level of incidental take relative to recreational fisheries managed by the IDFG was not likely to jeopardize the continued existence of listed salmonid species or result in the destruction or adverse modification of designated critical habitat when the prescribed terms and conditions are followed. Analysis of the effects of the recreational fishery actions addressed resulted in a finding that the levels of take permitted to the IDFG by the existing permit do not jeopardize the continued existence of listed salmonid species.

The proposed modification of permit 1233 does not authorize any additional take of listed Snake River fall chinook salmon, or sockeye salmon. The proposed modification authorizes incidental take of steelhead in resident species and anadromous salmon fisheries at levels no different than were considered in the original opinion, before take prohibitions were promulgated. The modification does allow recreational fishing for anadromous Snake River spring/summer chinook salmon to be expanded into additional river reaches and provides for annual adjustments of incidental take limits based on the predicted annual returns of the early, spring chinook component of listed Snake River spring/summer chinook and changes in population status. Analysis of the effects of the proposed modification results in a finding that the annual take

levels that would be authorized under the modification do not jeopardize the continued existence of listed salmonid species.

## **9.0 Reinitiation of Consultation**

Reinitiation of consultation is required if: (1) The amount or extent of take specified in the permit is exceeded, (2) new information reveals effects of the action that may affect ESA-listed species or critical habitat in a manner or to an extent not previously considered, (3) the action is subsequently modified in a manner that causes an effect to ESA-listed species or critical habitat that was not considered in the biological opinions, or (4) a new species is listed or critical habitat is designated that may be affected by the action.

## **10.0 Magnuson-Stevens Act Essential Fish Habitat Consultation**

### **10.1 Background**

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS must provide conservation recommendations for any Federal or State action that would adversely affect EFH (§305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*,

contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NMFS is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

## **10.2 Identification of Essential Fish Habitat**

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook (*O. tshawytscha*); and coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*)(PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

## **10.3 Proposed Action and Action Area**

For this EFH consultation, the proposed actions and action area are as described in detail in the biological opinion (Section II.). The action is the modification of an incidental take permit pursuant to section 10(a)(1)(B) of the ESA for the continuing implementation and management of fishery harvest regulations by the Idaho Department of Fish and Game (Permit #1233, modification 1). The proposed action area is the portion of the Snake River basin in Idaho in which anadromous salmonids may occur and is part of the EFH for chinook and coho salmon. Assessment of the impacts on these species' EFH from the above proposed action is based on information provided in the permit application and the biological opinion.

## **10.4 Effects of the Proposed Action**

As described in detail in Section 5 of the biological opinion, the proposed action may result in short- and long-term adverse effects to a variety of habitat parameters. These adverse effects are associated with interference with adult passage as a direct result of interception of a portion of the returning fish by fishers.

## **10.5 Conclusion**

NMFS concludes that the proposed action would adversely affect designated EFH for chinook and coho salmon.

## **10.6 EFH Conservation Recommendation**

Pursuant to Section 305(b)(4)(A) of the MSA, NMFS is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. NMFS understands that the conservation measures described in the Permit Applications that will be implemented by WDFW and USFWS and Terms and Conditions (see Section II.) above are applicable to designated salmon EFH and address the adverse effects. Therefore, NMFS recommends that those same Conservation Measures and Terms and Conditions be adopted as the EFH Conservation Recommendations for this consultation.

## **10.7 Statutory Response Requirement**

Pursuant to the MSA (§305(b)(4)(B)) and 50 CFR 600.920(j), Federal agencies are required to provide a detailed written response to NMFS' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

## **10.8 Consultation Renewal**

The NMFS must reinitiate EFH consultation if the proposed actions are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR Section 600.920(k)).

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